FAO Fisheries Technical Paper No. 220 FIIU/T220

THE WORLD SUPPLY AND DEMAND PICTURE FOR CANNED SMALL PELAGIC FISH

28.4.82
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FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

THE WORLD SUPPLY AND DEMAND PICTURE FOR CANNED SMALL PELAGIC FISH

by

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Rome 1981

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M-47
ISBN 92-5-101143-5

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PREPARATION OF THIS PAPER

This paper is part of the output of the FAO Project to Improve the Utilization of Small Pelagic Fish (GCP/INT/325 (NOR)) funded by the Norwegian Government under a funds-in-trust arrangement with FAO. It seeks to identify the current supply and demand situation for canned small pelagic species in order to give indications of future prospects to producers and potential producers, particularly in developing countries. For those interested in markets for small pelagic species in general, this paper should be read in conjunction with the companion volume, Markets for Frozen Small Pelagic Fish by Etienne Matton, FAO Fisheries Technical Paper No. 221, Rome 1981.

Distribution :

FAO Fisheries Department
FAO Regional Fisheries Officers
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For bibliographic purposes this document should be cited as follows :

Lanier, B.V. The World supply and demand picture for canned small pelagic fish. FAO Fish.Tech.Pap., (220):111 p.
1981

ABSTRACT

The report reviews the extremely diversified international market for canned small pelagic fish in three main sections. Section one examines the species and products involved. Section two analyses the supply side of the market : world landings of small pelagic species, output of canned products and quantities entering international trade. Section three analyses the demand side of the market, emphasising national markets which are foreseen as absorbing the increased exports anticipated in coming years. Three appendices tabulate data on landings, production potential and tariffs.

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NOTES ON TABLES

Symbols:

- denotes quantity zero or nil

0 denotes quantity more than zero but less than half the smallest unit to which figures are rounded.

.... indicates data unavailable.

n.e.i. denotes 'not elsewhere included'.

* indicates an estimate.

Sources:

Catch/Landings data are derived from recent volumes of the FAO Yearbook of Fisheries Statistics, Catches and Landings, supplemented by official national statistics.

Canned output data are compiled from official national statistics, supplemented by recent volumes of the FAO Yearbook of Fisheries Statistics, Fishery Commodities.

Export and import data are compiled from official national trade statistics, supplemented by the 1979 volume of the FAO Yearbook of Fisheries Statistics, Fishery Commodities.

Sources as indicated for other data.

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1. INTRODUCTION

Small pelagic species are caught, canned and consumed world-wide. These species are represented in the fish populations of all the oceans and seas of the world. They are caught by various methods - from primitive to highly sophisticated - in at least small quantities by inhabitants of nearly all the world's coastal nations.

The canning of these species commenced in earnest after World War II. An extremely diversified and truly international market has since developed for canned small pelagic products, characterized by a wide variety of product-types and a very significant proportion of world output entering world trade channels. While the number of nations that furnish most of the supplies entering world trade channels are comparatively small in number, nearly all of the countries of the world are represented in the destinations of these products. Each exhibits different preferences among the many product-types available. This makes for a world market picture of some complexity.

The picture is analyzed in three broad sections in this report. Section one is introductory, providing an examination of the species and products involved. Section two analyzes the supply side of the market: world landings of small pelagic species; world output of canned products utilizing these species; and world export supplies of canned small pelagics. Section three analyzes the demand side of the market, with emphasis on those national markets which are foreseen absorbing the increased world export supplies of canned small pelagic products anticipated in coming years.

A. Definition of small pelagic species

For the purposes of this study, small pelagic species are definied as shown in Table 1, where the common and scientific names of those species included are listed. Included species are those being canned currently as well as those with some potential for canning in the future. Common names utilized in Table 1 and throughout the study are those used by FAO; alternative common names and synonymous scientific names are occasionally shown in parentheses for purposes of clarity.

Small pelagic species are commonly characterized by their abundance - total landings of species in Table 1 comprised nearly one-half of world-wide marine fish landings in 1979 - density of schools, their comparatively high fat content, and the very different properties (particularly oil and fat content) of individual fish between seasons.

B. Species currently being canned

Among the species groups listed in Table 1, the herrings, pilchards and mackerels account for the bulk of the current canned production. Other herring species, excepting atlantic thread herring, are currently canned in small quantities only as are some other mackerel species.

Table 1

Small pelagic species (as defined for this report), Principal canned species (*), and Important canning countries or regions

Common name 1/	Scientific name	Major Canning Countries/Regions
Herrings		
* Atlantic herring	Clupea harengus	Europe, Scandinavia, USA & Canada
Pacific herring	Clupea pallasi	
Red-eye round herring	Etrumeus teres	
* Pacific thread herring (=sardina crinuda)	Opisthonema libertate	Ecuador and Panama
Atlantic thread herring	Opisthonema oglinum	
Sprats		
Sprat	Sprattus sprattus	
Chilean sprat	Clupea bentincki	
Sardines		
* Indian oil-sardine	Sardinella longiceps	Philippines
* Round sardinella (=spanish oil-sardine)	Sardinella aurita (=anchovia)	Venezuela
* Brazilian sardine	Sardinella brasiliensis	Brazil
Fringescale sardinella	Sardinella fimbriata	
Scaled sardines	Harengula spp.	
Sardinellas n.e.i.	Sardinella spp.	
Pilchards		
* Japanese pilchard (=sardine)	Sardinops melanosticta	Japan and the Republic of Korea
* Californian pilchard (=sardine)	Sardinops caerulea	Mexico
* Chilean pilchard (=sardine)	Sardinops sagax	Peru and Chile
* South African pilchard	Sardinops ocellata	Namibia and South Africa
* European pilchard (=sardine)	Sardina pilchardus	Europe and Morocco
Menhadens		
Atlantic menhaden	Brevoortia tyrannus	
Gulf menhaden	Brevoortia patronus	
S.E. Pacific menhaden	Brevoortia maculata	
S.W. Atlantic menhadens	Brevoortia spp.	
Bonga	Ethmalosa fimbrata	
Anchovies		
* European anchovy	Engraulis encrasicolus	Spain, Portugal, France, Italy & Morocco
Japanese anchovy	Engraulis japonicus	
* Anchoita (=argentine anchovy)	Engraulis anchoita	Argentina
North pacific anchovy	Engraulis mordax	
Cape anchovy	Engraulis capensis	
Atlantic anchoveta	Cetengraulis endentulus	
Central pacific anchoveta	Cetengraulis mysticetus	
'Stolephorus' anchovies	Stolephorus spp.	
Anchovies n.e.i.	Engraulidae	

Table 1 (cont.)

Common name 1/	Scientific name	Major Canning Countries/Regions
Anchoveta		
Anchoveta (=peruvian anchovy)	Engraulis ringens	
Sauries		
Pacific saury	Cololabis saira	
Atlantic saury	Scomberesox saurus	
Other Clupeoids		
Spotted herring	Herklotsichthys punctatus	
Rainbow sardine (round herring)	Dussumieria acuta	
Ladyfish	Elops saurus	
Indo-pacific tarpon	Tarpon (=Megalops) Cyprinoides	
Tarpon	Tarpon (=Megalops) Atlanticus	
Other clupeoids	Clupeoidei	
Mackerels		
Narrow-barred king mackerel	Scomberomorus commerson	
Indo-pacific king mackerel	S. guttatus	
King mackerel	S. cavalla	
Atlantic spanish mackerel	S. maculatus	
Cero	S. regalis	
Sierra (king mackerel)	S. sierra	
W. african spanish mackerel	S. tritor	
Japanese spanish mackerel	S. niphonius	
King mackerels n.e.i.	Scomberomorus spp.	
* Chub (=spanish) mackerel	Scomber japonicus	Japan and many other countries.
* Atlantic mackerel	Scomber scombrus	Europe, Scandinavia and Canada
Indian mackerel	Rastrelliger kanagurta	
* Short-mackerel	Rastrelliger brachysoma	Philippines
Indian mackerels n.e.i.	Rastrelliger spp.	
Horse and Jack Mackerels, Scads		
* Atlantic horse mackerel	Trachurus trachurus	
Offshore jack mackerel (=antarctic jack)	Trachurus picturatus australis	
* Japanese jack mackerel	Trachurus japonicus	Peru and Chile
* Chilean jack mackerel	Trachurus murphyi	
* Pacific jack mackerel	Trachurus symmetricus	
* Mediterranean horse mackerel	Trachurus mediterraneus	
Rough scad	Trachurus lathami	
Cape horse mackerel (=maasbanker)	Trachurus capensis	
* Cunene horse mackerel	Trachurus trecae	
Jack and horse mackerels n.e.i.	Trachurus spp.	

Table 1 (cont.)

Common name 1/	Scientific name	Major Canning Countries/Regions
Horse and Jack Mackerels, Scads (cont.)		
Round scad	Decapterus maruadsi	
Russell's scad	Decapterus russelli	
* Scads	Decapterus spp.	Philippines (D. Macrosoma)
Hardtail scad	Megalaspis cordyla	
Bigeye scad	Selar crumenophthalmus	
Capelin	Mallotus villosus	
Polar cod	Boreogadus saida	
Norway pout	Trisopterus esmarkii	
Blue whiting (=poutassou)	Micromesistius poutassou	

1/ As used by FAO.

Notes:
n.e.i. = not elsewhere included.
Alternative common names and synonymous scientific names shown in parenthesis.

Jack and horse mackerels, sardines and anchovies are the principal species for canning purposes among the less important species groups. The other species groups listed in Table 1 - except for the menhadens, polar cod and norway pout, which apparantly are being canned only experimentally or not at all - are all represented in current canning activities around the world. Production of canned products utilizing these species - sprats, sauries, sardines, anchovies, anchoveta, horse and jack mackerels and scads, and capelin is relatively small in comparison to canned herring, pilchard and mackerel output. Sprat is canned in small quantities in Europe and Scandinavia, as is capelin. The canning of chilean sprat in Chile is thought to have been discontinued in recent years with the decline of landings. Pacific saury is being canned in Japan and the Republic of Korea.

C. The canned products

Small pelagic species are utilized in a wide variety of canned products, ranging from high-cost specialty items to low-cost products. Consequently, an analysis of the world market for these products presents a complex picture. Different products are necessarily produced for different markets and tastes according to the species used, the preparation of the fish prior to packing, the form or portions of the fish placed in the can, the ingredients included with the fish in the can, and the format (i.e. the size and shape of the can or air-tight container) used for presentation to the consumer. While of course products differ according to the species utilized, this aspect is further complicated by the fact that the same species may be used to produce very different products, depending on the time of year of catch (which affects basic fish properties, such as oil content, as well as fish size), its preparation prior to being packed, the form or portions of the fish placed in the can, and the ingredients with which it is packed.

Upon being caught but prior to packing, the fish may be prepared, or processed, in a variety of ways, depending on the desired product. The fish may be left trapped in the net for one to three days to empty their stomachs (in Scandinavia), they are usually headed and tailed, they may be gutted, partially gutted or not gutted, they may be completely, partially or not de-boned, they may be split, they may be skinned, de-finned or de-scaled or not, they may be filleted, chopped or ground, and they are often but not always brined to varying degrees. They usually are pre-cooked. They also may be smoked (normally linked to a drying process) or 'ripened' (cured) for a time with salt, acetic acid or spices (or a mixture of these) prior to packing.

It is possible, however, to group canned small pelagic products into four broad types based on the ingredients included with the fish in the can.

Oil pack

After the fish are prepared, they are packed with a vegetable oil (such as olive oil), salt and sometimes with some of their own juice, and fully sterilized. Also included in this category for convenience is the relatively small volume of product which is packed only in its own juices. The oil pack is the most commonly produced canned product, and accounts for the bulk of total canned small pelagic production. Nearly all species are packed in oil and this packing medium enjoys wide acceptance in the world's markets. They have the additional advantage of a long shelf-life - at least two years but very possibly much longer - if packed in good-quality, well-enameled cans.

Tomato sauce pack

After the fish are prepared, they are packed in tomato paste, with or without a vegetable oil, spices or vegetables, and fully sterilized. Tomato sauce packs are probably the second most important product-type in terms of volume. Cheaper fish varieties, such as mackerels, and fish of inferior quality are often packed in tomato paste because of its ability to mask flavour and appearance problems. Pilchards and sardines, however, are also commonly packed in tomato paste. The acid content of tomato sauce, and other ingredients if used, usually shortens the shelf-life slightly due to corrosive action on the tin-plate.

Brine or water (natural) pack

After the fish are prepared, they are packed in brine or water and fully sterilized. The brine, or water pack is also commonly used for cheaper varieties of fish; mackerels are widely packed in this medium, but so are herrings, saury, capelin and pilchards. While this pack may have a self-life nearly as long as oil-packed products, it accounts for less of total canned small pelagic production than tomato sauce packs.

Packs in other sauces and creams, pastes, and semi-preserved and marinated products

This heading includes a very wide variety of products, each produced in relatively small quantities for specialty markets, and encompasses both fully-sterilized and semi-preserved products.

Specialty sauce and cream items are usually packed in cans and fully sterilized. For these products, the fish are prepared in various ways, then pre-cooked in the sauce ingredients. Sauce and cream ingredients include salt, sugar, spices, pickles, lemon, vinegar, wine, peppers, cheese, curry, bacon, beer, soy sauce, mustard, pimento and gelatin, among others, depending on the desired product. Atlantic herring and pilchards are the most common species utilized in specialty sauce and cream packs.

Chopped and ground fish - usually anchovies or mackerels - are pre-cooked with other ingredients such as spices, then packed to produce paste products. These products are fully sterilized and thus have a long shelf-life.

The semi-preserved products are usually made of atlantic herring or mackerel, while the marinated products utilize atlantic herring almost exclusively. For both product-types, the fish must undergo considerable pre-packaging processing. For semi-preserves, the fish are stored in salt in barrels or bins for a time to impart the desired flavour and texture. After beginning this 'ripening' process, the product is filleted and usually packed in large cans, glass or plastic containers with salt, spices and other ingredients as the preserving agents. As a semi-preserve, however, the shelf-life of these products is generally about six months. The marinades are also a semi-preserved product with a shelf-life of up to six months when stored at 0° C. Prior to packing, atlantic herring are usually filleted. They are then most often packed in large tins, glass containers or plastic containers with salt, acid, sugar and a few other ingredients as preserving agents. While semi-preserved and marinated products are most often not strictly a 'canned' product - that is, sterilized and marketed in small consumer-size cans - they are discussed here and in other relevant sections of this study because of their similarity to canned products and their importance in certain markets.

Other Elements Relevant to Product Differentiation

Besides species, pre-packing preparation and packing ingredient differentiation, product differentiation is also a function of other elements. Important among these other elements is the form of the fish, or the portions of the fish, placed in the can. This element is tied to pre-packing preparation. In broad terms, however, the same species of fish may be used to produce different products, depending on whether a headed and gutted fish, fish fillets or fish portions (such as steaks) are placed in the can; additionally, other products (particularly mackerel products) are differentiated as to solid, chunk, grated and flake packs.

The canning format (can size and shape) is also an important element in product differentiation. Most commonly used can sizes and shapes presently utilized in the industry are listed in Table 2.

Yet another important element in the product differentiation equation is simply the product name placed on the can label. This is especially confusing with regard to the use of the label 'sardine'. Many different species which are not sardines are labelled and marketed as 'sardines'. Industry practices in this regard differ from country to country, depending on national labelling regulations and marketing considerations. This issue, as well as those raised in the preceding two paragraphs will be addressed in more detail in other relevant sections of this study. However, those species which are defined as canned 'sardines and sardine-type products' by the Codex Alimentarius Commission are listed in Table 3.

Table 2

Can sizes used for small pelagic fish

A wide variety of both tin-plate and aluminium cans are used for small pelagic fish including, round, rectangular, oval and obround*. Some of the more important sizes and capacities are listed below.

Shape	Capacity	Sections	Name
Rectangular	125	105 x 76	Dingley
	125	105 x 60	¼ Club
Oval	270	175 x 96	Pilchard
	375	160 x 108	
Obround	270	148 x 81	Hansa
	377	210 x 80	
Round	425	83	No. 1 Tall

* a can having a cross section with parallel sides joined by two semicircular ends.

Table 3

Species defined as canned sardines and sardine-type products by the Codex Alimentarius Commission

(revised where new species names have been introduced)

1. European pilchard	Sardina pilchardus
2. Japanese pilchard, Spotlined sardine	Sardinops melanosticta
3. Australian pilchard (sardine)	S. neopilchardus
4. Southern African pilchard	S. ocellata
5. Chilean pilchard, Pacific sardine	S. Sagax
6. California pilchard	S. caerulea
7. Round sardinella	Sardinella aurita (S. anchovia)
8. Brazilian sardine	S. brasiliensis
9. Shortbody sardine, Madeiran sardinella	S. Maderensis
10. Atlantic herring, Baltic herring	Clupea harengus
11. Sprat	(C. antipodum) Sprattus antipodum
12. Sprat	(C. bassensis) Sprattus bassensis
13. Fireland sprat	(C. fuegensis) Sprattus fuegensis

Table 3 (cont.)

14. Sprat	Sprattus sprattus
15. Sprat	Hyperlophus vittatus
16. Sprat	Nematalosa vlaminghi
17. Round herring	(Etrumeus micropus) E. teres
18. Machete, Mechuelo	(Ethmidium maculatus) Brevoortia maculata
19. Anchoita	Engraulis anchoita
20. Anchoveta	E. ringens
21. Fringescale sardinella	Sardinella fimbriata
22. Spotted sardinella	(S. Sirm) Amblygaster sirm
23. Indian oil sardine	S. longiceps
24. Goldstripe sardinella	S. gibbosa
25. Anchovy, California anchovy, Northern anchovy	Engraulis mordax

The above list is amended from the FAO/WHO, Recommended international standard for canned sardines and sardine-type products Joint FAO/WHO Food Standards Programme, Codex Alimentarius Commission CAC/RS 94 - 1978 1/ which was updated to include additional species by the fourteenth session of the Codex Committee on Fish and Fishery Products, Bergen 1980. In some cases the genus or species has been changed recently. The old versions are given in parenthesis.

1/ Available from FAO or WHO

2. SUPPLIES OF SMALL PELAGIC SPECIES AND CANNED PRODUCTS

A. World-wide landings of small pelagic species

The approximate disposition of world catches of small pelagic species is given in Table 4 below. The data has been extracted from the ICS Fishery Data for pelagic species, less the tunas. The proportion used for reduction to fish meal is overwhelming, but has remained fairly constant during the period of reporting. Fresh consumption and freezing (partly of raw material for the canning industry) have shown significant gains and the proportion used for canning has shown a strong upward trend.

Table 4

Estimated disposition of world catch
(1000 m.t.)

	1974	1975	1976	1977	1978	1979
Total production	23132	23421	25396	25493	27018	26808
Canning	2867	3209	2511	2705	3858	3848
Freezing	2284	2665	2858	3174	3335	3335
Curing	3515	3523	3708	3318	3444	3264
Reduction	11301	11025	12680	10954	11933	11710
Fresh consumption	3165	2999	3239	4342	4448	4651

Figure 1 illustrates the trend of total landings as well as that of the principal species used for canning. These data are given in detail in Appendix A Table 1. Trends in catches in each major, FAO defined fishing area, are shown in Figure 2, with a detailed breakdown of catches by area and country in Appendix B.

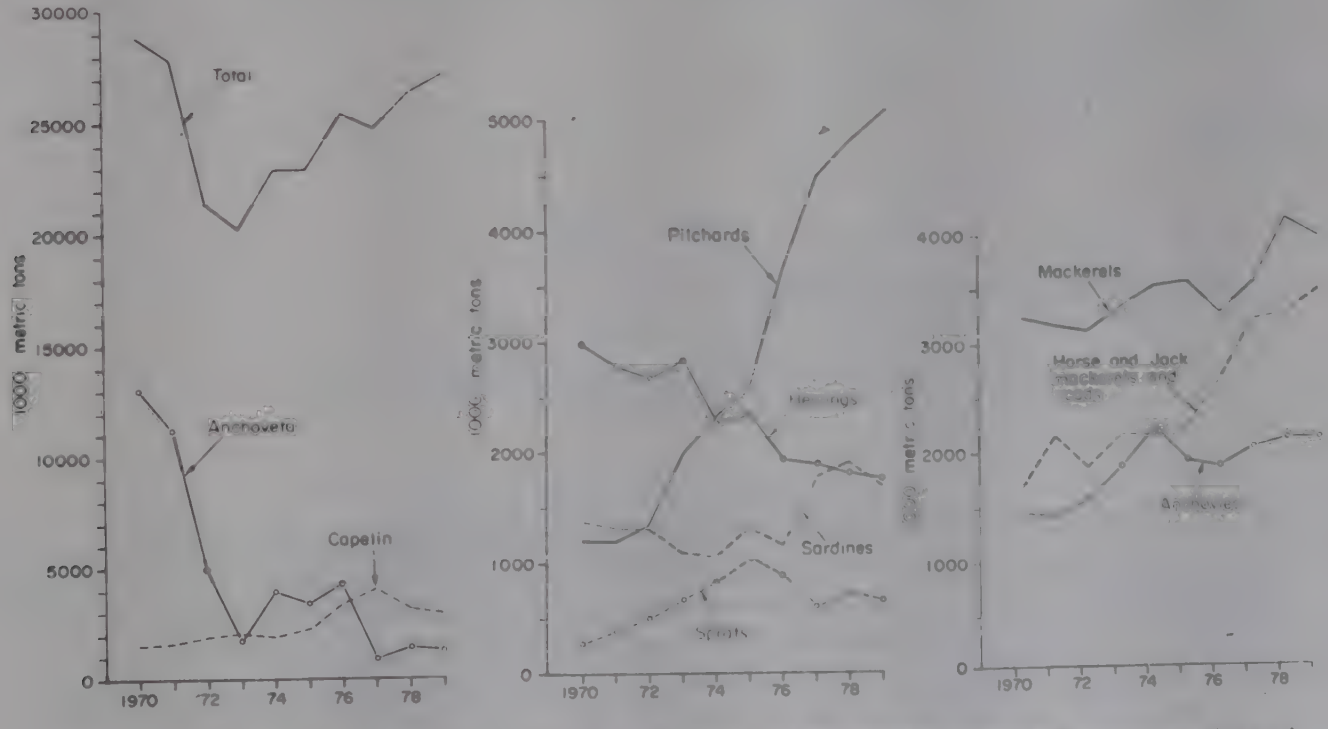

Fig. 1 Small pelagic landings - total and by major species groups (5793)

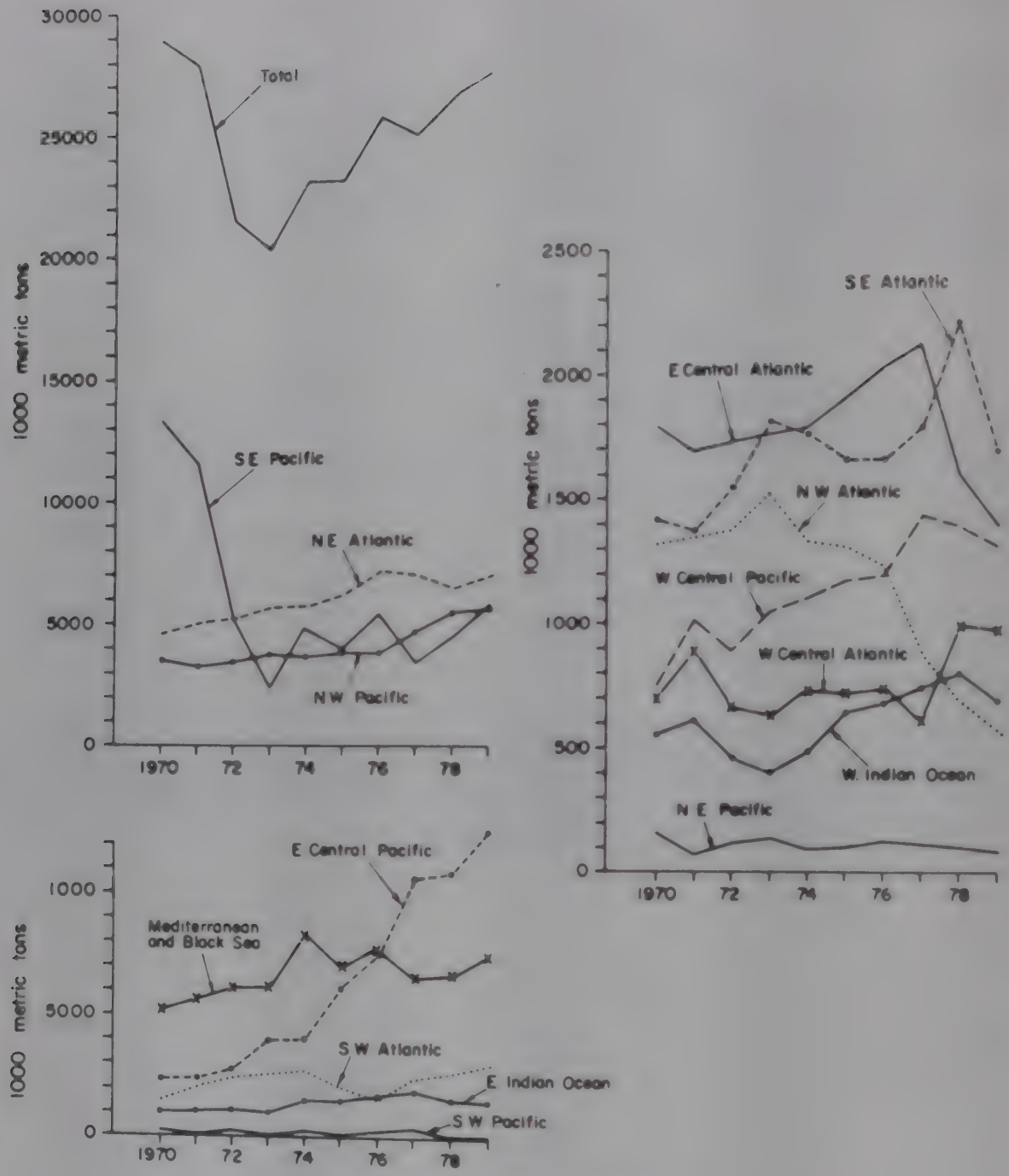

Fig. 2 Annual small pelagic landings, total and by fishing area

The trends in annual landings of small pelagic species in the major producing countries are discussed in the following section in conjunction with an examination of canned product output. Appendix Table A-2 provides data describing the total annual landings of small pelagic species in most countries between 1970 and 1979, as well as the landings of the principal small pelagic species in these countries. A more detailed examination of national catches by fishing area and species may be seen in Appendix B.

B. World output of canned small pelagic products

As may be seen in Figure 3 and Table 5, 1/world production of canned small pelagic products expanded about 16 percent between 1972 and 1979. Total annual output increased sharply until 1975, on the basis of growing canned sardine/pilchard production, thereafter declining but subsequently recovering as both sardine/pilchard and mackerel production fluctuated widely. These two species-types accounted for the bulk (78 percent in 1979) of canned small pelagic production. Although fluctuating, canned sardine/pilchard production registered a 21 percent increase in 1979 as compared to 1972. Canned mackerel output rose 19 percent between 1972 and 1979, registering its greatest gains in 1977 and 1978.

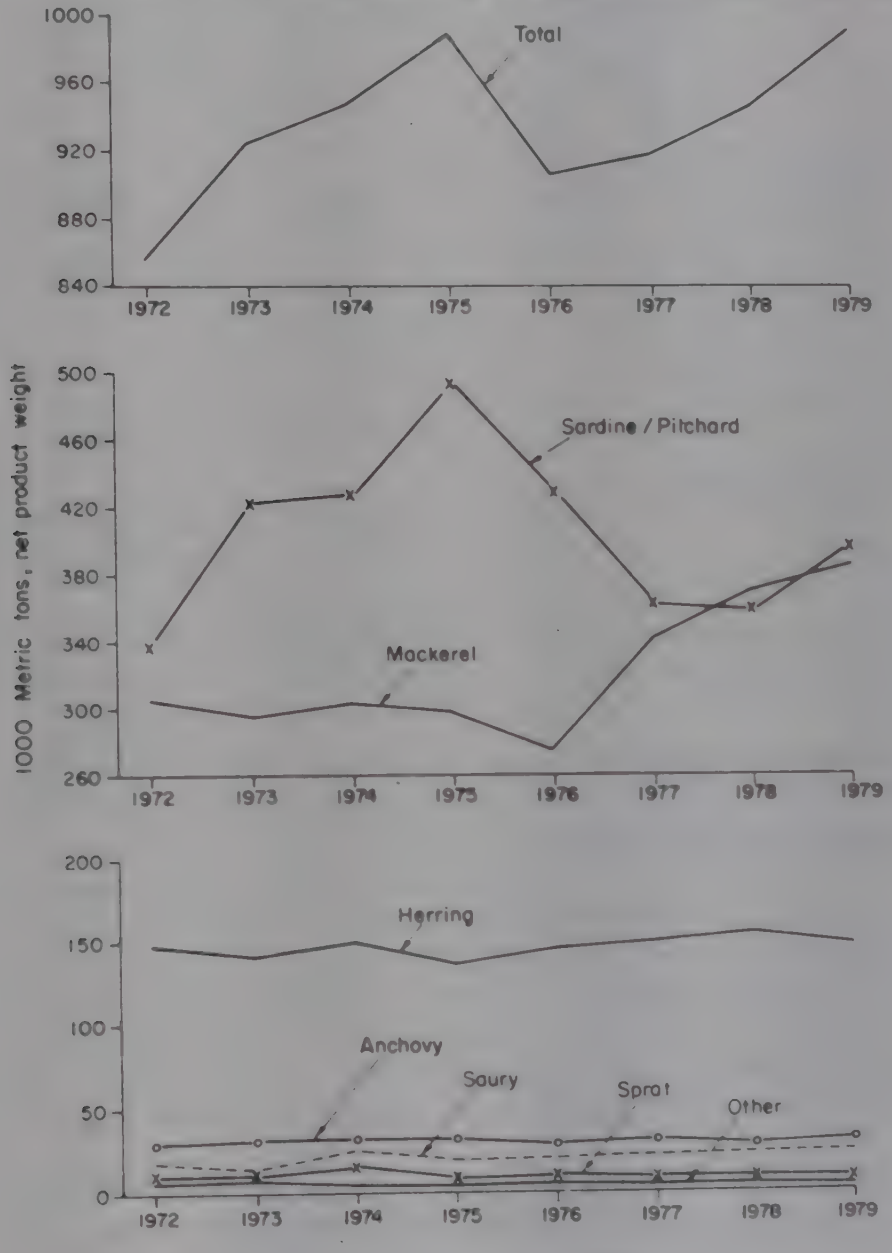

Fig. 3 Output of canned small pelagic products in selected countries - total and by species - type

1/ It should be noted that production in selected countries is not included in Figures 3 and 4, and Table 5. Production data for several minor producing nations were unavailable. For other countries, chiefly the U.S.S.R. and Eastern European nations, canned fish production data are aggregated, preventing a determination of what portion of total canned output is made up of small pelagic products.

Table 5

Production of canned small pelagics - total and by major product-type
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total 1/	856	924	948	992	911	921	956	993
Sardine/pilchard	338	422	425	494	432	363	354	408
Mackerel	305	293	302	300	272	342	369	364
Herring	145	141	148	136	144	148	152	146
Anchovy	28	31	29	30	28	30	34	33
Saury	17	13	24	19	19	20	23	18
Sprat	12	12	13	8	9	9	10	10
Other sardine-type products	11	12	7	4	5	5	5	5
Canned production thought to be composed to substantial degree of small pelagic products 2/	118	125	140	133	149	135	123	
U.S.S.R. output of prepared products in air-tight containers 2/ 3/	580	608	685	778	843	873	945	1032

1/ Does not tally precisely with sum of species-types in later years as unspecified production in Thailand is included in the total.

2/ Not included in total; see page 22 last paragraph and page 24 first paragraph.

3/ All types of fish, crustaceans and molluscs excluding caviar and king crab, in air-tight containers.

Annual production levels of canned herring, anchovies, saury, sprat and 'other sardine-type' products remained relatively stable between 1972 and 1979. Canned herring products were the third-most important species-type among canned small pelagic products - 15 percent of the total in 1979. Annual output of these products fluctuated between 136 and 152 thousand tons during the period. Annual production levels of canned anchovies fluctuated between 28 and 34 thousand tons between 1972 and 1979, and accounted for about three percent of total canned small pelagic output in the latter year. Canned saury production reached its peak level in 1974, but retreated slightly thereafter, accounting for about two percent of total canned small pelagic output in 1979. Production of canned sprat and other sardine-type products both remained small but stable in recent years.

The annual output of all canned small pelagic products by region and major producing countries between 1972 and 1979 is shown in Figure 4. Europe and Africa, traditionally the leading producing regions, lost their position of predominance during 1977. European production fluctuated widely after 1972, but in 1979 was less than two percent above the level of that year. Europe's contribution to world-wide output of canned small pelagic products dropped from 37 percent in 1972 to 32 percent during 1979. Production levels in other regions increased after 1972; Asia showing the most significant advances. Asian output rose very steeply beginning 1977, and in that year replaced Europe as the leading producing region. Asia accounted for 33 percent of world-wide canned small pelagic output in the latter year, up from 28 percent in 1972. South American output of canned small pelagic

products increased 73 percent between 1972 and 1979, accounting for about 20 percent of world-wide production in the latter year (up from 14 percent in 1972). The output in North and Central America rose moderately through 1979, contributing eight percent of world-wide production in that year.

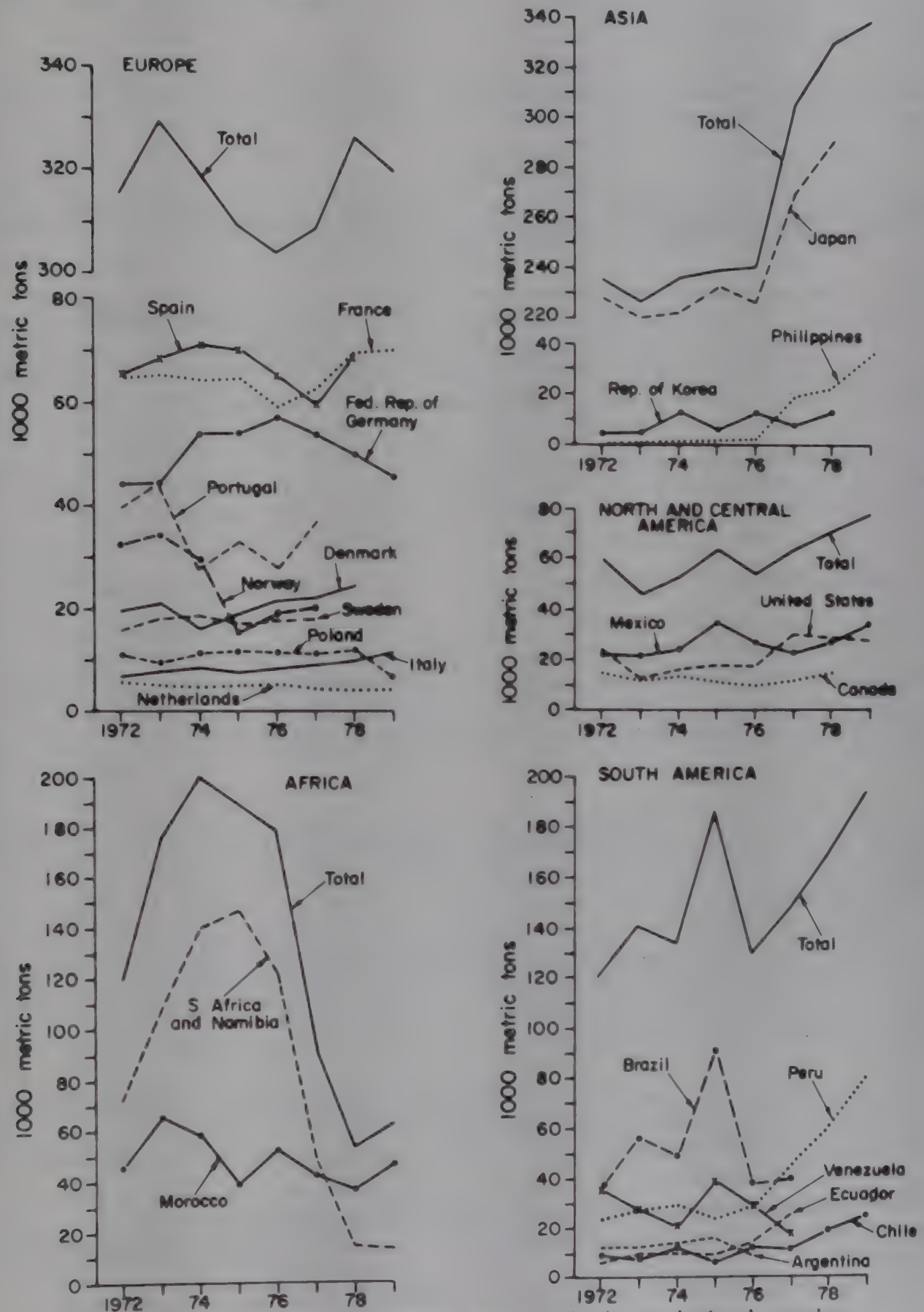

Fig. 4 Total output of canned small pelagic products - by region and major producing countries

Canned sardine/pilchard production

World output of canned sardines/pilchards expanded impressively between 1972 and 1975, then retreated the following three years although 1979 witnessed some recovery. In that year, sardine/pilchard production accounted for fully 41 percent of total canned small pelagic output, unchanged from 1972.

Annual canned sardine/pilchard production during these years is broken down by region and producing country in Table 6.

Table 6

Production of canned sardines and pilchards - total by region and selected countries
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978
Total	337.5	421.7	425.3	493.6	431 5	363.3	
Europe	109.4	120.5	106.0	117.0	104.9	112.6	
Spain 1/	44.7	45.8	46.5	50.8	47.6	43.5	52.2
France	30.4	35.5	31.4	31.4	28.8	31.9	35.9
Portugal	27.4 3/	32.6 3/	21.6	29.0	22.4	30.2	33.3*
Italy 2/	5.0	4.8	4.9	4.5	5.0	5.8	6.8
Sweden	1.9	1.8	1.6	1.3	1.1	1.2	
North & Central America	21.7	21.3	23.4	34.6	26.4	21.3	27.1
Mexico 4/	21.7	21.3	23.4	34.6	26.4	21.3	25.9
Costa Rica	....	....	....	....	....	....	1.2
South America	36.0	101.5	92.3	149.6	92.7	96.2	
Peru	12.7	14.6	16.8	16.7	22.0	36.1	43.9
Brazil	34.7	56.2	48.9	91.2	37.0	37.4	33.2*
Venezuela 5/	35.8	27.4	21.0	38.7	28.4	16.8	13.0*
Chile	2.8	3.3	5.6	3.0	5.3	5.9	10.2
Africa	113.8	170.4	195.4	181.8	170.8	86.0	44.1
Morocco 6/	41.7	62.3	53.9	35.9	46.2	36.5	28.8
S. Africa & Namibia	69.2	106.3	138.6	143.4	121.9	47.2	13.6
Algeria	2.9	1.8	2.9	2.5	2.7	2.4	1.7
Asia	6.6	8.0	8.2	10.6	36.7	47.2	52.7
Japan	4.2	6.4	6.6	9.1	35.2	45.5	51.1
Israel	2.3	1.5	1.5	1.4	1.2	1.1	0.6
Malaysia, Penn. 6/	....	0	0.1	0.1	0.3	0.6	1.0
China 7/	0.1	0.1	0	....	....	0	-

1/ Includes small quantities of sprat and sardinellas.
2/ 'Pilchard and anchovy, in oil'.
3/ Continental Portugal only.
4/ Includes canned mackerel, anchovy and pacific thread herring products.
5/ Includes small quantities of canned mackerel and possibly other canned products.
6/ Export data.
7/ Taiwan Province; annual production of all canned fish in the rest of China is placed at 6-7000 tons.

Europe remained the leading producing region until 1978 (except for 1975), but the growing output in South America replaced European predominance in canned sardine/pilchard production in 1979. Asia recorded the most substantial increases in output of any region, but production in North and Central America also advanced. African production dropped sharply after 1976.

European pilchard is the basis of the sardine canning industry in Europe and Scandinavia, as well as in North Africa and the Levant. In Europe, Spain remained the largest producer as landings of european pilchard advanced strongly through 1976, remaining high the following three years. Forced back into their own waters by the extension of EEZs by many coastal nations, the Spaniards have had to concentrate on species suitable for canning. The share of total landings utilized for canning rose from 19 to 33 percent between 1973 and 1979. Spanish fishing and canning activities are concentrated in northwest Spain and the Canary Islands. The latter area is an important base for the exploitation of West African waters and for export to African markets.

France and Portugal were the other major producers of canned sardines in Europe. French production expanded moderately in recent years despite falling landings of european pilchard, and a decline in the number of sardine canning enterprises from 51 in 1972 to 36 in 1978. The remaining canneries have turned increasingly to the import of frozen fish to maintain raw material supplies. In Portugal also, the output of canned sardine expanded moderately in recent years despite a decline in the number of canneries and relatively stable landings of european pilchards. Italian production expanded moderately after 1975 (see Table 6 footnote 2), reaching higher levels in these years than in earlier years when european pilchard and european anchovy landings were at comparable or greater levels.

European pilchard is also utilized for the production of canned sardines in Morocco. Moroccan output 1/ of these products declined between 1973 and 1978 with the decline of european pilchard landings. The migration of pilchard schools offshore, sometimes beyond the reach of the Moroccan fishing fleet, curbed catches during these years; 1979 apparently witnessed a return of schools to inshore waters and the resulting heavier landings and canned production.

South Africa and Namibia were the remaining key producers in Africa. South african pilchard is utilized in these countries for the production of canned pilchard products. The output of these products in Namibia and South Africa dropped precipitously after 1976 with the depletion of south african pilchard stocks and the resulting contraction of landings. Although available data combines production in the two countries, nearly all of the 12,000 tons produced during 1979 is thought to be of Namibian origin. Landings of south african pilchard - and consequently canned production - in Namibia are expected to remain at very low levels for the immediate future; the catch quota for south african pilchards for 1980 permitted the production of only four thousand tons of canned pilchard products.

In South America, several different species were utilized for the production of canned sardine/pilchard products. Peruvian and Chilean output was based on the chilean pilchard. Production of canned products in these countries utilizing this species increased steadily

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1/ Export data are shown in Table 6. Actual production levels are higher than those shown as about one-quarter of national output is consumed domestically.

between 1972 and 1976, then rose sharply during 1977 to 1979. The tremendous growth of landings of chilean pilchard in both Peru and Chile may be seen in Appendix Table A-2. In Peru the number of canneries increased from about 40 in 1977 to over 60 in 1980. The number of canneries and canning capacity also increased markedly in Chile in recent years. Brazil and Venezuela were the other producers of canned sardines of note in South America. Brazilian canning activities were based on the brazilian sardine, while the round sardinella was utilized by the Venezuelan industry. Canned sardine production in both countries fluctuated even more widely than landings. In Mexico, canned sardine production was based largely on the californian pilchard (Monterrey sardine), but other species, such as mackerels, scads and anchovies, were also canned as 'sardines'. Recent years have seen pacific thread herring (crinuda) emerge as a raw material source of growing importance because of supply problems with californian pilchard. Mexican output of canned sardines increased substantially during 1978 and 1979 as part of government policy to utilize these products as an important element in low-cost domestic protein supplies. National canning capacity expanded almost ten percent in 1978 alone.

Asian production exhibited a very impressive expansion commencing 1976. Nearly all this output represented Japanese production of canned sardines/pilchards. Japanese pilchard was the raw material utilized, and the resulting product is marked as sardine or pilchard, depending on the market. A nearly hundred-fold increase in Japanese landings of japanese pilchard during the past decade fueled the expansion of canned sardine/pilchard output. In Peninsular Malaysia, China (Taiwan Province), and the Philippines canned sardine production increased in recent years, but remained relatively small.

Canned Mackerel Production

Canned mackerel ranked with canned sardine/pilchard as the most important species-type products among canned small pelagics. Canned mackerel products accounted for 37 percent of canned small pelagic output in 1979, slightly above the level of 1972. World output of these products remained relatively stable through 1976, but recorded substantially higher levels in 1977 to 1979.

Annual canned mackerel production between 1972 and 1979 is described by region and producing country in Table 7. (Canned products utilizing mackerels, horse and jack mackerels as well as scads are aggregated in Tables 5 and 7.)

Asia was by far the leading producing region, accounting for fully 67 percent of world output of canned mackerel products in 1979. Europe contributed most of the balance (20 percent), but South American producers began establishing their importance in recent years. While increasing, production in North America remained relatively minor in the global context. African production continued low and relatively stable between 1972 and 1979.

Canned mackerel production in Asia and the world is dominated by the Japanese industry. Mackerel output accounted for the bulk of Japanese canned fish production, and was based on Japan's tremendous landings of chub mackerel; approximately 25 to 30 percent of chub mackerel landings were used in the canning industry. Some jack mackerel, however, was also canned. Japanese canned mackerel output generally fluctuated with chub mackerel landings. Landings and canned production both increased markedly in 1977 and 1978; production dropped during 1979, however, and was below the output of 1972 in that year. The canning industry in the Philippines got underway in 1972, but national production did not take off until 1977, after the imposition of annual quotas on imported canned mackerel and sardine

products. The industry received a further boost in 1979 when the ad valorem duty on imported tin plate was lowered from 50 to 40 percent. The impact of these steps may be seen in Table 7; Philippine output of canned mackerel (and sardine) 1/products jumped from slightly more than one thousand tons in 1976 to an estimated 34 thousand tons in 1979. Canned mackerel production in the Republic of Korea, China (Taiwan Province), Thailand and Peninsular Malaysia also increased in recent years (see Table 7).

1/ See Table 7, footnote 5

Table 7

Production of canned mackerels - total, by region and selected countries
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	305.3	293.4	302.4	299.6	272.0	342.3	369.1	364.3
Europe	65.9	63.5	66.9	60.6	60.3	66.5	69.7	71.5
France	24.8	23.0	27.6	26.3	24.9	28.4	30.4	32.1
Denmark	6.0	6.8	6.1	6.8	9.7	12.2	14.2	
Spain	14.8	15.5	18.9	13.8	11.6	9.8	11.1	
Portugal	9.9 1/	8.8 1/	4.1	3.0	3.8	5.2	4.2	4.2
Netherlands	3.5	3.3	3.3	3.3	3.9	4.0	3.3	3.4
Norway 2/	2.4	2.8	2.3	2.1	2.5	2.4	2.2	2.2
Sweden	0.1	0.1	0.1	0.4	0.2	0.2	0.2	
Belgium	0.3	0.2	0.2	0.2	0.1	0.2	-	0
United Kingdom 3/	4.1	3.0	4.3	4.7	4.1	4.1*	4.1*	4.1
North America	7.5	2.3	3.0	4.5	3.4	16.5	15.4	12.8
United States	6.2	1.3	1.7	4.4	3.0	14.8	14.7	11.9
Canada	1.3	1.0	1.3	0.1	0.4	1.7	0.7	0.9
South America	9.3	12.0	18.1	14.0	13.0	15.1	24.5	30.9
Peru	0.9	2.7	9.3	5.4	5.8	8.3	14.4	19.2
Chile	5.6	4.2	5.5	3.8	6.8	4.8	8.1	9.7
Argentina	2.8	5.1	3.3	4.8	0.4	0*	0*	0
Brazil						2.0	2.0	2.0
Africa	6.9	5.8	5.9	7.1	5.9	6.4	6.7	4.7
Morocco 4/	3.9	2.5	4.0	3.3	5.9	4.6	5.7	4.0
South Africa	3.0	3.3	1.9	3.8	-	1.8	1.0	0.7
Asia	215.7	209.8	208.5	213.4	188.9	237.8	252.8	244.4
Japan	214.0	208.2	206.5	211.2	184.6	211.0	222.1	203.8
Korea, Rep.	0.2	0.8	1.1	1.6	2.8	3.3	5.3	3.2
Philippines 5/	0	0.1	0.3	0.4	1.2	18.7	22.0	34.0
China 6/	1.5	0.7	0.5	....	....	1.8	1.5	1.5
Thailand	....	....	....	....	....	1.2		
Malaysia, Penn. 4/	....	0	0.1	0.2	0.3	1.8	1.9	1.9

1/ Gross weight; Continental Portugal only. 2/ Includes small quantities of canned tuna
3/ Includes sardine- and anchovy-type products. 4/ Export data
5/ Includes sardines and small quantities of tuna, but bulk is thought to be round scad and mackerel products.
6/ Taiwan Province.

Europe was the second most important region in the canned mackerel production picture. Atlantic mackerel was the principal species utilized, but atlantic horse mackerel was also canned in Spain and Portugal. France was the chief producer of canned mackerel products in Europe, and was able to expand her output of these products, despite a decline in atlantic mackerel landings, by importing raw material. French production rose nearly 30 percent between 1972 and 1979.

Denmark became the second-largest producer of canned mackerel products in Europe with a more than two-fold expansion of output between 1972 and 1978. During this period, Danish landings of atlantic mackerel registered an almost fourteen-fold increase. Denmark supplanted Spain as the second-largest European producer of canned mackerel products in 1977. Spanish output of these products was 25 percent lower in 1978 than in 1972 in spite of no decline in her landings of atlantic mackerel and atlantic horse mackerel during the past decade. Portuguese production of canned mackerel products also declined between 1972 and 1975. A moderate recovery was staged after 1975 in concert with the slight increase in chub mackerel (this species was also canned in Portugal) and atlantic horse mackerel landings. Annual canned mackerel production levels in other European producers of note - Netherlands, The United Kingdom, Norway, Sweden and Belgium - all remained quite stable and at relatively low levels.

In South America, heavier production in Chile and particularly Peru boosted the region's output of canned mackerel products more than 200 percent between 1972 and 1979. Peruvian output rose from less than one thousand tons in 1972 to nearly 20 thousand tons during 1979; expansion was especially rapid during the last three years. It was during these years that Peruvian landings of chub mackerel, but particularly chilean jack mackerel, recorded substantially heavier volumes. These two species were the bases of Peruvian canned mackerel production. Chilean production was also based on these two species. Landings in Chile of chub mackerel and chilean jack mackerel grew rapidly beginning 1976, while the expansion of canned products utilizing these species commenced in 1978. Argentine landings of chub mackerel and the output of canned products based on these landings both declined from their peak levels of 1973 to negligible volumes by 1977.

The United States accounted for most canned mackerel production in North America. American output jumped to substantially higher levels beginning 1977 in concert with the expansion of pacific jack mackerel and chub mackerel landings.

In Africa, Moroccan production accounted for most of the comparatively small output of canned mackerel products. Moroccan output in recent years was slightly higher than in 1972 and 1973; landings of chub mackerel and jack and horse mackerels, however, registered increases proportionally much greater than those of canned mackerel output between 1972 and 1979. In South Africa (mackerels were apparently not canned in Namibia), production of canned mackerel products fell concommitantly with the contraction of the national fishery for chub mackerel.

Canned Herring Production

At less than half the levels of either canned mackerel or sardine/pilchard output, canned herring production accounted for about 15 percent of the total output of canned small pelagic products in 1979, (17 percent in 1972). Annual world output of these products was very stable between 1972 and 1979, the production level in the former year being virtually the same as that in the latter year.

Total annual production of canned herring products - by region and producing country - are provided below.

Table 8

Production of canned herring - total, by region and selected countries
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	145.4	140.7	147.5	136.3	143.9	147.8	152.3	145.5
Europe	108.8	108.7	111.4	102.9	106.3	99.6	98.9	90.9
Germany, Fed.Rep 1/	43.7	44.4	53.5	53.6	57.5	53.2	50.6	46.3
Denmark	13.5	14.5	10.2	12.3	12.2	10.0	10.6	
Norway	22.5	23.6	17.8	9.4	11.3	12.4	11.5	11.5*
Sweden	9.7	10.5	11.2	9.7	9.7	9.7		
Poland	6.8	5.9	7.2	7.8	8.2	7.9	9.8	5.5
United Kingdom	4.7	4.3	6.4	4.0	3.6	3.6*	3.6*	3.6*
France	4.3	2.0	2.4	3.4	1.2	0.7	1.0	1.1
Netherlands	2.3	1.9	1.6	1.9	1.5	0.7	0.8	0.8
Iceland 2/	0.6	1.2	0.8	0.6	0.8	1.3	1.3	1.8
Belgium	0.7	0.4	0.3	0.2	0.3	0.1	0	0
North America	30.3	22.2	26.2	24.3	23.7	22.9	27.8	29.1
United States	17.1	11.5	13.9	13.6	14.3	13.7	14.1	15.4
Canada	13.2	10.7	12.3	10.7	9.4	9.2	13.7	13.7*
South America	6.3	9.8	9.9	9.1	13.9	25.2		
Ecuador 3/	6.3	9.8	9.9	9.1	13.9	25.2		
Africa	-	-	-	-	-	0.1	0.4	0.3
South Africa & Namibia	-	-	-	-	-	0.1	0.4	0.3

1/ Includes other canned small pelagic products.
2/ Includes canned capelin.
3/ Thought to include some mackerel products.

Although output declined, Europe remained the principal producing region for canned herring products, accounting for fully 63 percent of world output during 1979. Production in North America first declined, but recovered to previous levels by 1979; this region contributed 20 percent of world output in that year. Production in South America rose rapidly beginning 1976, and by 1979 accounted for 17 percent of world output of canned herring products, up from only four percent in 1972.

European production of canned herring products dropped 16 percent between 1972 and 1979, the result of diminishing herring catches in the north Atlantic. The Federal Republic of Germany was the leading producer of canned herring products, 1/ accounting for 50 percent of European output and 32 percent of world output of these products in 1979. Annual production expanded then subsided after 1972, but output was still above that year in 1979. This

1/ Data in Table 8 represents an overstatement of canned herring output. Production of other products, such as canned sardine, pilchard and mackerel, are included here.

moderate production increase took place in the face of a drastic decline in the levels of atlantic herring landings during the past decade; canned output was maintained through the importation of raw material. Scandinavian countries produced the bulk of the balance of European output. Denmark and Norway both recorded reduced production levels after 1972 as atlantic herring landings in both countries declined substantially. Norwegian output contracted 51 percent between 1972 and 1979, while Danish output dropped over 20 percent during this period. Both countries resorted to the importation of raw material for cannery supplies. Sweden and Iceland did not experience a similar reduction in canned herring output after 1972. Relatively stable landings of atlantic herring in both countries maintained canned production levels in Sweden, and supported a moderate increase in output in Iceland. Icelandic output, however, was still relatively small. Polish output of canned herring productions registered a steady expansion through 1978, then dropped off during 1979. Landings in Poland of atlantic herring fell sharply after 1975.

In North America, canned herring production by both Canada and the United States declined then recovered, recording volumes in 1979 roughly comparable to those in 1972. Landings of atlantic herring in both countries registered moderate increases after 1973. Atlantic herring products are marketed primarily as 'Maine sardines' by American producers, but small volumes are marketed as herring products. Canadian producers also market their products as both herring and sardine products.

Ecuador was the only producer of canned herring products of note in Central and South America, although small volumes are known to have been produced in Mexico and Panama. Production of these products was based on pacific thread herring landings. Canned pacific thread herring products are marketed as sardines by Ecuadorian producers. The output of these products expanded considerably after 1975 concommitant with the impressive expansion of pacific thread herring landings.

Canned Anchovy Production

World output of canned anchovy products remained quite stable after 1972, fluctuating between 28 and 34 thousand tons. Production of these products in 1979 accounted for about three percent of the world output of canned small pelagic products. Total annual production of canned anchovy products - by region and producing country - may be seen in Table 9.

The bulk (52 percent in 1979) of canned anchovy production was accounted for by several nations in Europe. Argentine output accounted for nearly all the balance, although production in Morocco registered notable increases beginning in 1977.

European production of canned anchovy products, as well as that in Morocco, was based on the european anchovy. France, Spain, Portugal, Italy and Sweden accounted for most European output of canned anchovy products, Spain being the largest producer. Annual production levels in all these countries except France were relatively stable between 1972 and 1979. French production, however, declined moderately during this period. Landings of european anchovy in Spain increased substantially after 1972, while those in Italy and France were relatively stable. Landings in Portugal were very low during the entire period, while Sweden reported no landings of anchovy; these countries apparently imported raw material for canning.

Moroccan landings of european anchovy increased moderately beginning in 1976. This is revealed in the apparent rise in Moroccan canned anchovy production commencing that year.

Table 9

Production of canned anchovies - by region and producing country
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	28.2	30.6	28.9	30.0	28.0	29.9	33.7	33.4
Europe	19.1	22.8	19.7	18.3	18.9	17.1	17.9	17.5
Spain	6.1	7.5	7.4	6.4	7.2	6.7	6.6	
Italy	2.0	3.0	3.2	3.1	3.5	3.2	3.3	4.0
France	5.4	5.4*	3.2	3.8	3.7	2.0	2.9	2.9*
Sweden	3.2	3.8	3.6	3.7	3.1	3.6	3.1	
Portugal	2.4 1/	3.1 1/	2.3	1.3	1.4	1.6	2.0	0.9
North America	0	0	0.1	0.1	0.1	2.5	0	0.1
United States	0	0	0.1	0.1	0.1	1.4	0	0*
Mexico	....	....	....	....	....	1.1	0	0.1
South America	9.1	7.2	8.8	11.3	8.6	8.7	13.7	13.7*
Argentina	8.9	7.2	8.7	11.1	3.5	8.5*	13.5 2/	
Chile	0.2	0	0.1	0.2	0.1	0.2	0.2*	
Africa	-	0.6	0.3	0.3	0.4	1.6	2.1	
Morocco 3/	-	0.6	0.3	0.3	0.4	1.6	2.1	

1/ Continental Portugal only.
2/ Production of all canned fish.
3/ Export data.

Argentina was the remaining producer of note in the canned anchovy production picture. Anchoita (argentine anchovy) was utilized in this country for the production of canned anchovy products. Annual output was relatively stable during 1972-1976, but recorded a sizable increase in 1978. Landings of anchoita in Argentina declined considerably after 1972.

Production of Canned Sprat and Saury

World output of canned sprat and saury was relatively small and concentrated in a few countries. Together, production of these products amounted to about the same level as that of canned anchovies. Saury products accounted for the larger volume of the two. Available data describing world output are summarized below.

Table 10

Production of canned saury - total and by country
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	17.1	13.0	23.7	19.0	19.2	20.4	22.5	18.0
Japan	14.2	9.9	13.2	15.5	10.3	17.1	15.6	13.3
Korea, Rep.	2.9	3.1	10.5	3.5	8.9	3.3	6.9	4.7

Japan accounted for the bulk of the production, but output in the Republic of Korea nearly matched that of Japan in some years. Annual world output of canned sprat (or brisling) products between 1972 and 1979 may be seen below.

Table 11

Production of canned sprat - total and by country
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	11.7	11.9	13.2	8.3	9.2	8.9	10.4	9.5*
Norway	7.5	8.0	8.9	4.0	5.3	5.5	8.0	
Poland	4.2	3.9	4.1	4.2	3.4	3.4	2.4	1.5
France 1/	....	....	0.2	0.1	0.5	-	-	-

1/ 'Sprats - anchois'.

Production of other canned small pelagic products

The production in several countries of miscellaneous canned anchovy- and sardine-type products is provided below. Output of these products represented small and diminishing volumes.

Table 12
Production of miscellaneous canned anchovy- and sardine-type products - total and by country
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	11.1	12.3	6.6	3.5	5.4	5.1	5.0	5.2*
Europe	1.5	2.5	2.4	2.4	4.0	3.9	3.7	3.7*
Sweden	1.2	2.0	2.3	2.3	3.8	3.8	3.5	3.5*
Belgium	0.3	0.5	0.1	0.1	0.2	0.1	0.2	0.2*
South America	9.6	9.8	4.2	1.1	1.4	1.2*	1.3*	1.5*
Peru	9.5*	9.8*	3.1*	1.1	0.8	0.6	0.7	0.9*
Argentina	0.1	0	1.1	0	0.6	0.6*	0.6*	0.6*

The output of canned fish in selected countries is presented below. No further details as to the product-type of this output were available, however a substantial portion of it is thought to be small pelagic products. All of the countries included in Table 13 below reported significant landings of small pelagic species important in current world canning activities, and some - such as the Soviet Union, recorded landings of very significant levels (see Appendix Table A-2). Except for Yugoslavia, Poland and the Republic of Korea, nearly all canned fish output in these countries remained within the producing nation for domestic consumption. Even including the excepted countries, available data indicated that comparatively little of the canned fish production shown in this Table reached the international market.

Table 13

Production of canned fish in selected countries
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Europe								
Bulgaria	8.8	10.2	11.5	13.1	10.0	10.4	11.5	
German Dem. Rep.	55.3	58.3	58.2	52.4	55.4	49.0	46.6	
Italy 1/	6.8	8.0	8.5	8.2	8.4	8.7	8.9	10.5
Poland 2/	18.0	16.5	21.2	22.5	25.4	17.8	24.6	
Rumania	12.6	13.4	21.1	20.0	25.2	25.6	19.8	23.3
Yugoslavia 3/4/	4.1	6.0	7.2	6.0	11.5	9.0		
Ireland	1.8	0.8	2.6	3.2	3.4	1.5	1.2	
North America								
Cuba	1.2	2.8	2.4	2.0	1.8	1.1	1.4	0.9
Asia								
Burma	5.1	5.2	4.9	5.4	5.6	5.8	6.1	6.3
Korea, Rep.	4.4	3.7	1.9	0.4	2.2	5.8	2.6	
U.S.S.R. 5/	580.2	607.5	684.9	777.6	842.9	872.7	944.9	1032.2

1/ 'Various fish, in oil'.
2/ 'Fish in tomato sauce' and 'other fish in oil'.
3/ Export data.
4/ 'Fish sterilized' and 'fish paste'.
5/ All types of fish, crustaceans and molluscs, excluding caviar and king crab, in air-tight containers.

Yugoslavia apparently accounted for the bulk of canned output shown in Table 13 that reached the international market. European pilchard accounted for most Yugoslav landings of small pelagics, but small volumes of european anchovy, sprat and chub and atlantic mackerel were also reported. Canned sardine (pilchard), anchovy, mackerel and herring products were reported in receipts by importing nations.

In the Republic of Korea, production of both canned mackerel and saury products was reported (see Tables 7 and 10). Unspecified canned output shown in Table 13, if of small pelagic products, was probably canned japanese pilchard or japanese anchovy, landings of which were substantial in Korea in recent years.

Both canned herring and sprat production were reported in Poland (Tables 8 and 11). Output shown in Table 13, evidenced by landings and receipts of importing countries, were mostly canned sardine (pilchard), mackerel and sardinella products.

The U.S.S.R. landed heavier volumes of small pelagic species than any country except Japan. Virtually all species of importance in current canning activities were landed in quantity, and all the well-known canned small pelagic products were thought to be represented in the tremendous volume of prepared fish, crustacean and mollusc products reported produced and shown in Table 13. However, nearly all this output apparently remained in the domestic market. Reported receipts by importing countries of canned sardine, sprat,

anchovy, mackerels and herring were very minor in comparison to the reported total output.

Little is known of the unspecified canned production shown for the remaining nations - Bulgaria, the German Democratic Republic, Italy, Romania, Ireland and Burma - except what can be deduced from landings data (see Appendix Table A-2) and fragmentary receipts by importing countries. Italian production of canned sardines (pilchards) and anchovies were reported (Tables 6 and 9). The unspecified output shown in Table 13 was at least partially comprised of canned mackerel products; these products were exported in small volumes and are popular among Italian consumers. Irish output was probably composed of at least some canned herring and mackerel products. European pilchard, sprat and mackerels all figured heavily in the landings of the German Democratic Republic, Bulgaria and Romania. Burmese landings of marine fish were not specified as to species.

C. World Export Supplies of Canned Small Pelagic Products

The volumes of annual exports of canned small pelagic products by most producers and exporters of note between 1974 and 1979 are shown in Table 14 and analyzed in Figure 5. 1/ The overall trend of total export volume of canned small pelagic products between 1974 and 1979 was upward.

Total export volume as a percentage of the total output of canned small pelagic products (as indicated in Table 5) hovered around 50 percent during four of the six years of the period. This percentage reached a high of nearly 60 percent in 1976, up from slightly less than 45 percent during 1975. Total export volume represented slightly more than 50 percent of the total output of canned small pelagic products in 1979.

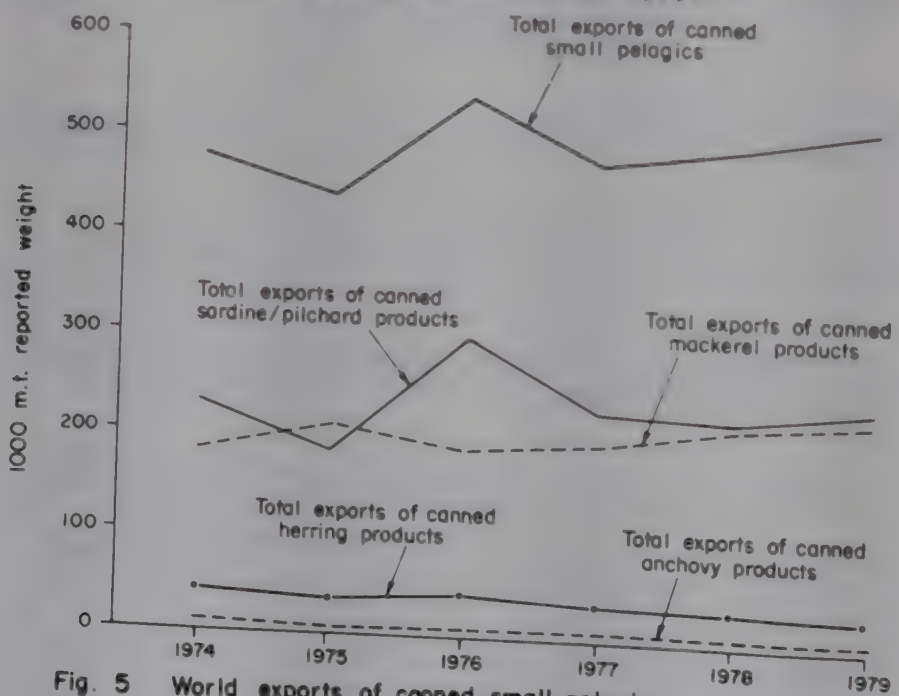

Fig. 5 World exports of canned small pelagic products by species

1/ These data are thought to encompass most of world export volume, but exports by a number of nations are excluded. Countries whose shipments clearly consisted for the most part of re-exports - such as Singapore - are excluded, as are exporting nations which shipped only small volumes, data for which were unavailable or aggregated with other types of products. Several exporting countries of some importance - such as Yugoslavia, Poland and the U.S.S.R. - are excluded from Table 14 because of the lack of definitive data; these nations are discussed below.

Table 14

Exports of canned small pelagic products by selected countries
(1000 metric tons, reported weight)
and
percentages of total export volume

	1974	1975	1976	1977	1978	1979
Total	436.3	409.7	489.6	481.0	497.7	510.2
Japan	164.8	199.7	199.1	201.3	214.0	230.5
Morocco	58.2	39.5	52.5	42.7	36.6	47.2
Spain	33.8	33.7	47.2	42.3	45.9	44.5
Portugal	27.6	27.8	32.9	37.4	41.0	37.8
Peru 1/	9.4	4.5	9.6	22.0	45.6	40.4
Ecuador	6.4	4.5	9.9	15.7	17.8	17.8 F
Chile	0	0	1.1	1.8	3.5	5.6
Norway	20.3	13.9	17.4	17.8	16.5	14.3
Canada	9.4	9.4	10.7	7.2	7.8	8.6
Netherlands	7.6	10.0	7.8	7.2	6.2	6.9
German Fed. Rep.	7.3	6.1	7.3	7.2	6.5	6.8
Denmark	5.8	6.8	8.7	9.8	10.3	11.9
United Kingdom	5.5	4.5	5.4	4.3	5.2	4.4
Brazil	0.6	0.9	0.7	0.8	3.1	1.7
Malaysia, Penn.	0.2	0.3	0.6	2.4	2.9	2.9 F
Sweden	3.5	2.5	3.3	3.1	3.6	3.0
Rep. of Korea	2.7	1.2	1.4	2.4	3.7	2.0
Italy	0.3	0.3	0.9	0.9	1.0	2.1
France	2.7	0.8	1.0	1.7	1.5	1.2
Iceland	0.9	0.6	0.7	1.3	1.2	1.0
Panama	0.5	0.4	0.8	1.0	1.1	0.9
United States	0.9	1.2	1.1	1.1	0.7	0.7
Argentina	1.3	0.3	0.7	1.3	0.6	0.6 F
Venezuela	0.3	1.1	0.5	0.1	0.1	0
Mexico	1.5	0.9	1.5	1.3	4.1	3.1
Belgium-Luxembourg	0.7	0.5	0.6	0.4	0.2	0.2
S. Africa & Namibia	64.0 F	37.0 F	64.3 F	41.7 F	7.2 F	3.5 F
Thailand 2/	0.1	1.3	1.9	4.8	9.8	10.6
	Percentages of total export volume					
	%	%	%	%	%	%
Japan	35	46	38	42	39	47
S. Africa & Namibia	22	15	22	10	2	1
Morocco	13	10	10	10	7	8
Spain	6	7	9	10	9	8
Portugal	6	7	5	9	9	8
Peru	2	1	2	4	10	8
Other European	12	10	8	11	10	10
Other Countries	4	4	6	8	17	10

1/ Includes small volumes of canned tuna & bonito. F. - FAO estimate
2/ 'Other fish canned'; thought to be primarily canned mackerel & sardine products, but may include some canned tuna.

Five countries almost completely dominated the export supply picture by 1979. Japan, Morocco, Spain, Portugal and Peru furnished fully 79 percent of the volume of canned small pelagic products reaching the international market in that year. Among the remaining exporters, Norway was the largest, but exports by that nation declined substantially after 1974. None of the other exporting countries shipped more than ten thousand tons during 1979. The significant change in this picture was the virtual withdrawal of South Africa and Namibia from the market. Prior to 1978, these two countries were second only to Japan as exporters of canned small pelagic products. The reason for this spectacular decline was the demise of south african pilchard stocks.

The primary reason for the wide fluctuation in canned small pelagic exports between 1974 and 1977 may be seen in Table 14 and Figure 5. Exports by South Africa and Namibia changed substantially from year to year, dropping to a very low level by 1979. In that year they accounted for less than one percent of total exports, as compared to an almost 22 percent contribution during 1976. In 1978 and 1979 the continued growth of Japanese exports, as well as the expansion of those by Peru, Ecuador and Thailand pushed up the total despite the collapse of the Namibian and South African export industry. Japanese exports rose forty percent in 1979 as compared to 1974, its contribution to the total increasing from 35 to almost 46 percent during this period. The Japanese clearly consolidated their position as the dominant supplier in the canned small pelagic export market. Peru also established an important role in the international market, increasing her contribution to total export volume from less than two percent in 1974 to eight percent in 1979 with a four-fold expansion of exports. Ecuador and Thailand also registered notable increases in export volumes. Thai exports increased from a very low level to about ten thousand tons in 1979, accounting for two percent of the world total in the latter year.

Among the larger traditional suppliers to the world export market - Morocco, Spain, Portugal and Norway - export levels experienced more moderate changes. Moroccan exports trended downward, accounting for about nine percent of the world total in 1979 as compared to 12 percent in 1974. Spanish exports were over 30 percent heavier in 1979 than in 1974, contributing almost nine percent of the world total in 1979. Portuguese exports increased steadily between 1974 and 1978, then declined moderately in 1979, still accounting for almost eight percent of total export supplies in the latter year. Norwegian exports dropped 30 percent between 1974 and 1979, contributing less than three percent of the world total in the latter year.

Definitive data describing the exports of canned small pelagic products by the U.S.S.R. Poland and Bulgaria are unavailable. Available data are summarized below. (These data are not included in Table 14 or Figure 5).

Table 15

Exports of fish products and preparations, whether or not in air-tight containers
(1000 m.t.)

	1974	1975	1976	1977	1978	1979
U.S.S.R.	24.5	35.6	34.6	39.2	32.2	
Poland	3.3	2.9	2.5	2.0	2.0	
Bulgaria	3.8	3.6	6.8	3.7	4.3	

What proportion of these exports are made up of canned small pelagic products in unknown.

However, receipts by importing countries show that canned sardine, mackerel, anchovy, herring and sprat products were exported in at least small quantities by the U.S.S.R. and Poland, chiefly to European countries, but also to the United States, Canada, Australia and Nigeria.

Exports by Species-type

The break-down of total exports of canned small pelagic products by major species-type - sardine/pilchard, mackerel, herring and anchovy - is shown in Figure 5. The principal characteristics of, and developments in, each of these sectors since 1974 are discussed below.

Canned sardine/pilchard products

Annual levels of canned sardine/pilchard product exports fluctuated widely from year to year, especially during the 1974 to 1977 period. Total volume hit its highest level in 1976, nearly 300 thousand tons, only to drop sharply the following year. A recovery was staged during 1978 and 1979, and by the latter year these products accounted for nearly 46 percent of the total volume of canned small pelagic product exports; this represented little change from 1974. Of particular interest was the large proportion of canned sardine/pilchard production reaching the international market, indicating most producers are export orientated. In 1979 over 57 percent of the output by producers shown in Table 6 found its way into international trade channels. This represented a slight increase over the proportion during 1974. Annual shipments by most of the important exporters are provided in Table 16.

Table 16

Exports of canned sardine/pilchard products by selected countries
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	230.0	183.1	298.6	226.0	222.8	234.1
Spain	29.5	30.7	43.9	38.1	42.5	41.7
Portugal	22.0	23.3	28.6	31.2	35.5	31.2
United Kingdom	1.8	1.8	2.7	2.1	2.5	1.9
Italy	0.2	0.2	0.4	0.4	0.5	1.4
Denmark	1.1	0.9	1.0	0.7	0.6	0.3
German Fed.Rep., Belgium-Luxembourg, Netherlands & France	0.7	1.1	0.6	0.8	0.7	0.7
Japan	3.5	5.7	32.1	33.6	41.4	50.1
Malaysia, Penn.	0.1	0.1	0.3	0.6	1.0	1.0*
Morocco	53.9	35.9	46.2	36.5	28.8	40.9
S. Africa & Namibia	98.5*	67.4*	117.2*	41.7*	5.9*	3.0* 1/
Peru	6.4*	3.5*	7.7*	18.0*	34.6*	30.7*
Chile	0	0	1.0	1.0*	1.9	4.1*
Ecuador	6.4	4.5	9.9	15.7	17.8	
Brazil	0.6	0.9	0.7	0.8	3.1	1.7
Panama	0.5	0.4	0.8	1.0		
Venezuela	0.3	1.1	0.5	0.1		
Canada	3.7	4.7	4.2	3.2	4.2	5.8
United States	0.8	0.9	0.8	0.5	0.7	0.7

1/ Exports 1974-1979 include small volumes of canned sardines, mackerels, anchovies and red-eye round herring.

The crucial and most far-reaching development among exporters of these products was the tremendous year-to-year fluctuations then complete collapse of the Namibian and South African export industry. Shipments from these two countries accounted for one-third to nearly one-half of total supplies of canned sardine/pilchard products reaching the international market until 1976. In the following three years, however, exports dropped to very low levels, the result of the severe reduction in the size of south african pilchard stocks. In 1978 and 1979 the South Africans were obliged to import canned sardines to fill domestic requirements. Prior to 1978 Namibia and South Africa shipped very heavy volumes of canned pilchard products to the United Kingdom, Zaire and the United States, and substantial quantities to other European and African importing nations, as well as to Asia.

The sharp rise in exports of canned sardine/pilchard products by Japan and Peru beginning in 1976 was the most important factor in bridging the gap in supplies caused by the Namibian and South African withdrawal from the market. Ecuadorian exports also increased substantially beginning 1976, but these shipments were nearly all to neighbouring Colombia. (Ecuadorian exports of canned pacific thread herring - 'pinchagua' - products in tomato sauce (representing the majority), oil and brine are marketed as sardine and consequently included here).

Japanese exports of canned pilchard/sardine products rose from less than two percent of total export supplies of these products in 1974 to over 20 percent during 1979, making Japan the leading supplier of these products to the international market in that year. About 95 percent of Japanese exports in 1979 were composed of the tomato sauce pack; the Philippines was the most important buyer (24 percent of the total), while shipments to Singapore, Peninsular Malaysia, the United Kingdom, Belgium, the United States, the Dominican Republic, Zaire, South Africa, Papua New Guinea and Sri Lanka accounted for 55 percent more of the purchases. Many countries in Europe, Africa, Asia and Latin America received at least small quantities.

Peruvian exports of canned sardine/pilchard products in a variety of packs increased about five-fold between 1974 and 1979, accounting for slightly less than 14 percent of total export supplies in the latter year. Western Hemisphere nations, led by the United States purchased about half of these exports, but shipments to Europe (especially the United Kingdom) and Papua New Guinea rose impressively in recent years.

Both Spain and Portugal recorded moderate increases in canned sardine export volume between 1974 and 1979. In the latter year, Spain contributed about 18 percent of total export supplies of these products, while Portugal accounted for more than 13 percent. Over 80 percent of Spanish shipments of canned sardines in 1979 originated in the Canary Islands. African nations accounted for most Canary Island exports, with Nigeria alone purchasing nearly 50 percent. The largest volumes of shipments from Continental Spain were destined for the United Kingdom, Czechoslovakia, Greece and the United States. Exports by Portugal in 1978 were dominated by sardines packed in olive oil (36 percent) and those packed in other vegetable oils or mixtures (54 percent). The remainder was packed in sauces, spices and other ingredients. The bulk of these products was destined for the large importing countries of Europe (especially the Federal Republic of Germany and the United Kingdom), the United States, Zaire and the U.S.S.R.

Moroccan exports, while up from the previous two years in 1979, exhibited a downward trend after 1974; in 1979 Morocco furnished about 17 percent of total export supplies. France and Nigeria were the most important destinations for Moroccan exports - 20 and 19

percent respectively in 1978 - but the United Kingdom (seven percent) and the Federal Republic of Germany (five percent) were also major buyers. The bulk of the remaining exports were destined for other African and European nations, but selected Western Hemisphere and Asian countries received smaller volumes.

Of the remaining exporters, Canada and Chile were the largest. Both exhibited increased exports in recent years, Chilean shipments rising from zero in 1974 to about seven thousand tons in 1979. A portion of Canadian exports of canned atlantic herring products (those shown in Table 16) were sold as canned sardines, presumably because of marketing considerations; nearly all these exports were destined for the United States, Latin America or Pacific Island nations, where consumers are generally more familiar with sardine than herring products. The exports of canned atlantic herring products by the United States are also marketed as sardines and are thus included in Table 16. Panamanian exports of canned pacific thread herring products are included for the same reason.

An unknown portion of the growing exports of canned small pelagic products by Thailand (shown in Table 14) are known to consist of canned sardines.

Canned mackerel products

Annual exports of these products climbed steadily between 1976 and 1979. During 1975 export volume registered a sharply higher level than either the preceding or following year. By 1979, however, canned mackerel exports were over 20 percent greater than those of 1974. They accounted for 38 percent of total export supplies of canned small pelagic products in 1974, but increased their contribution to nearly 44 percent by 1979. Producers of canned mackerel products are even more export-oriented than those of sardine/pilchard products. Over 60 percent of the world production of canned mackerel products (as compiled in Table 7) entered international trade channels during 1979, a slight increase over the proportion in 1974. Available data describing annual shipments by the major exporters of canned mackerel products may be seen below.

Table 17

Exports of canned mackerel products by selected countries

(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	181.7	209.3	186.8	196.1	216.2	223.4
Portugal	3.5	3.0	3.1	4.6	4.2	6.0
Denmark	2.2	2.4	3.4	4.9	5.9	6.8
Netherlands	1.2	2.9	1.6	2.1	2.0	2.3
United Kingdom	0.1	0.1	0.3	0.4	1.5	1.4
Norway	0.9	0.8	0.8	0.9	0.9	1.0
France	1.9	0.3	0.5	0.9	0.7	0.4
Sweden, Belgium-Luxembourg, Italy, Germany, Fed. Rep.	0.9	0.2	0.3	0.5	0.6	0.9
Japan	161.2	193.9	167.0	167.7	172.6	180.4
Rep. of Korea	2.5	0.9	1.4	2.3	3.3	1.9
Malaysia, Penn.	0.1	0.2	0.3	1.8	1.9	
Morocco	4.0	3.3	5.9	4.6	5.7	4.0
Peru	3.0*	1.0*	1.9*	4.0*	11.0*	9.7*
Chile	-	0	0.1*	0.8*	1.6*	2.9*
United States	0.2	0.3	0.2	0.6	4.3	3.8

The Japanese industry was the overwhelmingly dominant supplier of canned mackerel products to the international market. It furnished fully 88 percent of total export supplies of these products in 1974, and exceeded this level during 1975. At about 81 percent of total export supplies, the Japanese' dominating role moderated slightly by 1979, however, as export volume in that year still remained below the peak level of 1975 and other suppliers expanded their exports. A significant shift in the market for Japanese canned mackerel products also occured during this period. While during the early years of the period (1974 - 1975) Southeast Asian countries - particularly the Philippines - accounted for the bulk of Japanese sales, shipments to these nations in recent years were substantially lower; purchases by Western Hemisphere and European nations also declined in recent years. African countries (led by Nigeria), Middle Eastern countries (especially Saudi Arabia) and nations in Oceania (chiefly Papua New Guinea) accounted for most Japanese sales by 1978 - 1979. In the latter year, 29 percent of Japanese canned mackerel exports were destined for Nigeria, four percent for Egypt, four percent for Saudi Arabia, 15 percent for Papua New Guinea, and six percent were destined for the Philippines. Many nations received at least small volumes, however. The bulk (57 percent) of Japanese exports in 1979 was mackerel packed in tomato sauce; the brine or water pack accounted for about 36 percent and the oil pack seven percent.

Among other exporters, Peru recorded the most impressive growth in export volumes. Shipments rose from about three thousand tons in 1975 to about ten thousand tons during 1979, accounting for over four percent of total export supplies of these products the latter year. Both canned chub mackerel and chilean jack mackerel products were important in Peruvian shipments, most of which were destined for Western Hemisphere countries, led by the United States; Papua New Guinea received significant volumes, as did European, Asian and African nations. A variety of packs in tomato sauce, oil and brine were exported by Peru.

Denmark registered a more than three-fold expansion in exports of canned atlantic mackerel products between 1974 and 1979. Nearly 90 percent of these shipments were destined for the Federal Republic of Germany, Sweden and the United Kingdom in 1979. Only small volumes were destined for nations outside Europe and Scandinavia. Portuguese exports experienced a nearly two -fold expansion in volume during the period, while Moroccan exports remained relatively stable. Canned atlantic mackerel products, destined primarily for Europe (especially Italy), accounted for nearly all Portuguese exports, but some horse mackerel products were also exported. Italy, other European and Scandinavian countries and Africa received nearly all Moroccan shipments.

Exports by the United States of canned jack mackerel products jumped sharply higher during 1978 - 1979. Over 60 percent of these shipments were destined for Canada in the latter year, while 14 percent were received by Sweden.

Although still comparatively small, exports by the Netherlands, the United Kingdom, Peninsular Malaysia and Chile all registered notable increases in volume. A major portion of the growing Thai export of canned small pelagic products (Table 14) are also thought to be comprised of mackerel products.

Small but undetermined volumes of canned mackerel products are also known to be exported by Ecuador, Brazil, Argentina, Venezuela and Mexico. Significant volumes are thought to be exported by Spain, but these products are apparently included with sardine and anchovy products in Spain's official trade statistics.

Canned herring products

Export supplies of these products dropped substantially in recent years, especially after 1976. By 1979, canned herring products contributed less than seven percent to total export supplies of canned small pelagic products. Of interest here, however, was the comparatively low and declining proportion of the world output of canned herring products (as defined in Table 8) that reached international trade channels. While in 1974 this proportion stood at 30 percent, by 1979 it had dropped to less than 23 percent as producers devoted more and more of their dwindling supplies to filling domestic market demand. Shipments by the major exporting countries since 1974 are shown below.

Table 18

Exports of canned herring products by selected countries
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	43.8	36.2	42.2	38.3	35.3	32.9
Norway	15.6	10.6	13.2	13.4	12.9	10.3
Germany, Fed. Rep.	6.3	5.2	6.8	6.4	5.8	5.7
Netherlands	6.4	7.1	6.1	4.9	4.1	4.6
Denmark	2.0	2.9	3.5	3.6	3.3	4.4
Sweden	3.1	2.4	2.5	2.7	3.1	3.0
Iceland	0.6	0.5	0.7	1.3	1.2	1.0
United Kingdom	3.5	2.4	2.3	1.7	1.2	1.0
Belgium-Luxembourg & France	0.6	0.4	0.6	0.3	0.2	0.2
Canada	5.7	4.7	6.5	4.0	3.6	2.8

Norway was the major supplier of canned herring products to the world market. Norwegian shipments fluctuated widely from year to year, but export volume in 1979 was only two-thirds that of 1974. Like most herring producers, Norway was hit by the tremendous decline in atlantic herring landings. The bulk (71 percent in 1979) of Norwegian canned herring exports were smoked herring packed in oil; smoked herring packed in tomato sauce and kippered herring accounted for 16 percent of national exports during 1979. Other specialty products comprised the remainder. The United States was the principal destination for Norwegian canned herring products, purchasing over 50 percent of 1979 shipments.

The Federal Republic of Germany, Netherlands, Denmark, Sweden and Canada accounted for nearly all the remaining export supplies of these products. Of these countries, only Denmark recorded an increase in export volume after 1974, more than doubling her tonnage. The bulk (66 percent in 1979) of Danish shipments were made to the Federal Republic of Germany, but small quantities were exported to the rest of Europe, Scandinavia, Africa, Asia and the Western Hemisphere. Exports by the Federal Republic of Germany and Sweden were almost unchanged in 1979 as compared to 1974. The Netherlands, as well as the United Kingdom and Canada, all experienced a reduction in annual export volumes after 1974. Although still comparatively small, Icelandic shipments doubled between 1974 and 1978; a slight decline was reported during 1979, however.

Canned anchovy products

Export supplies of canned anchovy products fluctuated between seven and ten thousand tons since 1974, recording little change in annual volumes up to 1979. These products accounted for less than two percent of total export supplies of canned small pelagic products in the latter year and include salted anchovies packed in cans which are not sterilized. Like canned herring products, a relatively low proportion of world canned anchovy production enters the international market. On the basis of available data, slightly more than 25 percent of the world production of these products was traded internationally during 1979, indicating good domestic markets for canned anchovy products in the producing countries. Annual shipments by the principal exporting nations are shown below.

Table 19

Exports of canned anchovy products by selected countries
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	8.7	5.3	6.9	9.4	8.6	7.9
Spain	4.3	3.0	3.3	4.1	3.4	2.8
Portugal	2.1	1.5	1.5	1.6	1.7	2.0*
Italy	0.1	0.1	0.5	0.4	0.4	0.6
Denmark, Netherlands, German Fed. Rep, Belgium-Luxembourg, United Kingdom, Norway & France	0.6	0.3	0.2	0.4	0.4	0.4
Morocco	0.3	0.3	0.4	1.6	2.1	2.1*
Peru		0.4	0.3			
Chile	-	0				
Argentina	1.3	0.3	0.7	1.3	0.6	

Spain, Portugal and Morocco furnished nearly all export supplies of canned anchovy products in recent years. Among these countries, only Morocco recorded an increase in export volume. Nearly all Portuguese shipments were destined for Europe, with France alone taking over 85 percent of the total in 1978. Spanish exports of canned anchovy fillets declined moderately after 1974. By 1979 Spain was shipping small quantities of these products to a large number of countries all over the world. The United States, followed by the Federal Republic of Germany, Switzerland, Saudi Arabia and Canada were the principal destinations. Portuguese exports were relatively stable during the period. In 1978, over 60 percent of the total volume was destined for the United States. Small quantities were shipped to most regions of the world.

Argentine exports of canned anchoita are marketed both as anchovy and sardine products. The bulk of these shipments are thought to be destined for Brazil.

Production and exports of canned anchovy products by Chile and Peru, in spite of their huge anchovy resources, have remained low.

Other canned small pelagic products

Export volumes of other canned small pelagic products were quite small. Available data are shown below.

Table 20

Exports of other canned small pelagic products by selected countries

(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Sprat	4.3	3.0	4.3	4.2	3.4	3.6
Norway 1/	3.7	2.4	3.4	3.5	2.7	3.0
Denmark	0.5	0.6	0.7	0.6	0.5	0.4
German Fed. Rep. & United Kingdom	0.1	0.1	0.1	0.1	0.2	0.1
Saury	0.4	0.4	0.1	0.1	0.4	0.1
Japan and Rep. of Korea	0.4	0.4	0.1	0.1	0.4	0.1
Capelin	0.3	0.1	-	0	0	0
Iceland	0.3	0.1	-	0	0	0

1/ 'Sprat and sardine'; thought to be mostly sprat as no sardines were landed after 1975.

Interestingly, exports of canned saury products by Japan and the Republic of Korea are very low, in spite of total production levels only moderately below those of canned anchovy products (Table 5). Nearly all canned saury output by Japan and Korea was retained for domestic consumption.

3. DEMAND FOR CANNED SMALL PELAGIC PRODUCTS

The market for canned sardine, pilchard, mackerel, herring and anchovy products is truly an international one, characterized by a very large number of national markets. The demand side of the market thus contrasts sharply with the supply side, where five countries - Japan, Morocco, Spain, Portugal and Peru - accounted for about 80 percent of world export supplies of these products during 1979 (Figure 5). Consequently, total export volume is the most accessible measure of the magnitude of international trade in, and world import levels of, canned small pelagic products. International trade flows and import levels in turn provide an excellent indicator of the magnitude and relative importance of the numerous national markets because of the large proportion (about 50 percent in 1979) of world production of canned small pelagic products entering international trade channels.

A. International trade in canned small pelagic products

Taken as a measure of international trade levels, Figure 5 shows that trade and imports of canned small pelagic products expanded moderately in 1979 as compared to 1974. Total export/import volume during 1979, at 510 thousand tons, was down from the peak level of 1976 (538 thousand tons), but up almost nine percent over the 1974 level. Canned sardine/pilchard products remained the most important product-type during most of the period, accounting for nearly 46 percent of the total international trade volume of canned small pelagic products in 1979. Rising export/import levels of canned mackerel products after 1976, however, resulted in these products, at 44 percent, accounting for only slightly less of total trade volume in 1979 than sardine/pilchard or mackerel products. Further, the export/import volume of herring products declined 25 percent between 1974 and 1979, and during the latter year accounted for less than seven percent of total trade volume of canned small pelagic products. International trade in canned anchovy products remained below ten thousand tons during the period, recording little change in 1979 as compared to 1974. Export/import levels of other canned small pelagic products - sprat, saury and capelin - were less than four thousand tons in 1979, down slightly from previous years. A more detailed examination of changes in trade volumes of the major product-types may be seen in section 2.C.

B. The import markets

Annual imports between 1974 and 1979 of the most important market countries are provided in Table 21. As may be seen, these 28 nations received the bulk of canned small pelagic products entering international trade channels. In 1979, fully 72 percent of international shipments were destined for these countries; the percentage ranged between 76 and 80 percent in the preceding five years.

About 28 percent of canned small pelagic products entering world trade channels during 1979 - 145 thousand tons - was destined for countries other than the large importers shown in Table 21. These other importers comprised a large number of nations all importing comparatively small volumes of canned small pelagic products. Table 22 shows the magnitude of shipments of canned mackerel and sardine products by Japan to most of them during 1979. The length of this list illustrates the impressive breadth of the world market for canned small pelagic products. The level of Japanese shipments to each nation provides an indication of the magnitude of total imports by these countries of canned small pelagic products. Shipments to many nations were less than fifty tons, and are consequently shown as zero (see Notes on Tables).

Table 21

World trade volume of canned small pelagic products and imports by major importing nations
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
World Export/Import Volume	470	438	538	475	488	510
Imports by major market countries, total	374	334	430	371	384	365
Europe & Scandinavia	101.9	92.7	103.0	93.1	77.9	87.5
United Kingdom	25.7	29.7	31.3	32.8	15.2	22.1
France	21.1	15.4	17.6	17.4	17.4	19.0
Federal Republic of Germany	19.6	22.7	25.0	18.6	19.0	18.8
Italy	13.2	7.0	9.2	5.9	8.0	8.6
Belgium-Luxembourg	9.7	6.7	7.7	7.5	7.0	6.7
Austria	5.2	4.0	4.7	4.1	4.3	4.9
Sweden	2.6	2.6	3.2	2.9	3.4	3.9
Netherlands	3.6	3.5	3.3	3.1	2.7	2.7
Switzerland	1.1	1.1	1.0	0.8	0.9	0.8
Africa	52.4	62.3	119.0	103.6	123.7	84.2
Nigeria	7.4	22.6	46.4	68.4	90.9 1/	69.7 1/
Egypt	0.9	7.3	15.2	8.6	13.5	6.8 1/
Zaire	32.2	21.5	27.1	15.9	11.4	2.8 1/
Ghana	11.9	10.9	30.3 2/	10.7 1/	7.9 1/	4.9 1/
Asia	82.9	99.2	98.0	75.6	69.7	65.4
Philippines	45.6	55.4	43.0	23.6	29.1	21.5*
Malaysia	9.9	11.5	13.6	12.8	14.2	19.8
Peninsular	7.9	9.2	11.3	10.8	11.5	16.8 1/
Sabah	2.0	2.3	2.3	2.0	2.7	3.0 1/
Singapore	21.0 10/	26.0 4/	19.3	17.6	16.7	10.9
Indonesia	6.4	6.3	21.5	15.3	7.4	4.0 3/
Sri Lanka	0 1/	0 1/	0.6 1/	6.3 1/	3.3 1/	9.2 1/
North America & the Caribbean	85.2	46.6	60.8	40.9	48.8	53.3
United States	70.8	33.5	48.1	30.6	34.3	36.0
Canada	3.1	2.6	2.3	2.8	2.4	2.9
Jamaica	9.4 6/	6.8	9.8	2.0	7.4	9.4 1/
Dominican Republic	1.9 1/	3.7 1/	0.7 1/	5.5 4/	4.7 4/	5.0 1/
Middle East						
Saudi Arabia	4.0	5.0	7.8	12.8	11.0	17.0 5/
Oceania	37.4	21.7	30.5	29.7	32.7	37.6
Papua New Guinea 8/	21.7	10.6	21.8	19.7 1/	22.3 1/	27.9 1/
Australia 8/	7.9	8.4	5.1	5.5	6.4	5.6 9/
Fiji	7.8 4/	2.7 4/	3.6 4/	4.5 4/	4.0 1/	4.1 1/
South America	9.7	6.8	11.2	15.4	20.0	20.0 *
Colombia	6.8	4.0	9.1	12.4	17.0 7/	....
Bolivia	2.9	2.8	2.1	3.0	3.0 *	....

Table 21 (cont.)

1/ Reported exports by major exporters to country in question.
2/ January - August imports only
3/ Estimate based on January - June receipts of 1.7 thousand tons.
4/ Imports of 'fish and fish products, whether or not in air-tight containers', as reported by FAO.
5/ Estimate based on January - September receipts of 12.7 thousand tons.
6/ Partially estimated based on reported exports to Jamaica by Japan.
7/ Estimate based on the fact that the value of canned small pelagic imports in 1978 was 39 percent above that of 1977.
8/ Official data - 1974-1976 for Papua New Guinea and 1974-1979 for Australia - reported on fiscal year basis, i.e. from July - June. For example 1974 data above actually represents imports received between July 1973 and June 1974.
9/ Estimate based on receipts during the first nine months of the fiscal year.
10/ Estimate based on incomplete import data.

Table 22

Japanese exports of canned mackerel and sardine products in 1979, to countries other than major market countries.

More than 1000 t.	500 - 1000 t.	50 - 499 t.	Below 50 t.
Cuba	Barbados	American Samoa	Antiqua
Gabon	Greece	Bahrain	Burma
Hong Kong	Honduras	Belize	Cameroon
Israel	Kuwait	Botswana	Cyprus
Liberia	Malaysia	Congo	Denmark
Libya	Malta	Cook Islands	Finland
Mauritius	New Zealand	Djibouti	French W. Indies
Mozambique	Oceania (French)	El Salvador	Grenada
US Trust Terr. Pacific	Puerto Rico	Guam	Hungary
Vanatu	Thailand	Guatemala	Iceland
Western Samoa	Trinidad & Tobago	Ireland	Iraq
Yemen Arab Republic	Vietnam	Ivory Coast	Laos
		Jordan	Lesotho
		Kenya	Malawi
		Kiribati	Nauru
		Lebanon	Netherlands Antilles
		Oman	Nicaraqua
		Panama	Niger
		Qatar	Rwanda
		Reunion	St. Kitts
		Solomon Islands	St. Lucia
		Sudan	St. Vincent
		Tanzania	Seychelles
		Tonga	

Each of the major market regions and countries are examined below. The focus of this section is the structure and magnitude of regional and national demand, with emphasis on market countries which can absorb the growing production volume of canned small pelagic products now being generated - and which is anticipated to be generated in the future by emerging producers/exporters.

Europe and Scandinavia

This was the most important market region for canned small pelagic products entering international trade channels during 1979. Shipments to the nine selected countries in this region accounted for 17 percent of world trade volume in that year, down from 22 percent in 1974. Imports by these nations declined 14 percent between 1974 and 1979 as nearly all of them reported reduced receipts. The United Kingdom was the largest importer, followed closely by France and the Federal Republic of Germany. Annual import levels of each of the remaining six countries were 50 percent or less of the volumes received by the three largest nations.

For reasons which vary from country to country, Austria, Switzerland, Belgium - Luxembourg, Sweden and the Netherlands all appear to offer little or very limited hope as expanding markets for emerging and other exporting countries. Consequently, these national markets have not been analyzed in detail. While Belgium - Luxembourg imported significant volumes of canned small pelagic products and produced small and declining quantities domestically (Appendix Table A-3) between 1974 and 1979, annual import (and consumption) levels were static at about seven thousand tons after 1974. Consumption and imports continued to be concentrated in atlantic mackerel products (over 50 percent of the total market) and sardine-european pilchard - products (30 percent of the market). Atlantic herring (14 percent) and anchovy products (five percent) accounted for the balance; there were no significant changes in these market shares during the period. Portugal and Morocco furnished nearly all sardine imports during the period, while Denmark, Norway, Portugal and Morocco accounted for most imports of mackerel products. Japan and the Republic of Korea together exported slightly more than one thousand tons of chub mackerel products to Belgium - Luxembourg in 1979, but this volume represented little change from previous years.

In Sweden imports of small pelagic products rose during the period, due primarily to heavier receipts of mackerel products (68 percent of the total in 1979). Consumption - about 17 thousand tons in 1978; 1979 production data were not available - was concentrated in atlantic herring products (nearly 70 percent of the total), almost all supplied by national production. Domestic output filled nearly all demand requirements for other products except for canned mackerel. Here imports of atlantic mackerel products, chiefly from other Scandinavian countries, supplied most market needs. Small imports of canned chub mackerel products from Japan and the Republic of Korea were reported in some years, but these receipts exhibited no continuity of growth.

Austrian imports of canned small pelagic products - synonomous with total market supplies and apparent consumption - fluctuated between 4.1 and 5.2 thousand tons between 1974 and 1979, and exhibited a rising trend in recent years. Official data reported these as all anchovy and anchovy-type products, but there appeared to be some sardine products included, judging by their origins. Most imports were from European and Mediterranean exporting countries, but Asian exporters - Japan, the Republic of Korea, Malaysia, China (Taiwan Province), Thailand and the Philippines contributed a total of 1700 tons in 1979, representing an expansion in the receipts from Asian countries; further, the number of countries represented

expanded. This may indicate limited opportunities for future increases in exports to Austria of sardine products not based on european pilchard.

Dutch imports of canned small pelagic products declined steadily after 1974, and were less than three thousand tons during 1979. Annual export levels exceeded those of imports by more than two-fold each year during the period. Domestic production of canned mackerel and herring products also declined in recent years. National consumption of canned small pelagic products thus obviously contracted between 1974 and 1979. Demand appears to be concentrated in atlantic mackerel and sardine (european pilchard) products, although the magnitude of herring consumption was unclear as export volume exceeded the sum of domestic production and imports every year during this period. Annual canned mackerel exports (which along with canned herring accounted for virtually all export volume) also exceeded imports of these products every year. Nearly all imports were supplied by well-established exporters in Scandinavia and Europe, as well as by Canada and Morocco. Japan, the Republic of Korea, Venezuela and Argentina did succeed in exporting small volumes of canned sardine and mackerel products to the Netherlands, but this nation is not thought to offer good prospects for significantly heavier export sales in the future.

Swiss imports (and consumption) of canned small pelagic products were quite small and contracted slightly after 1974. Furthermore, annual volumes shown in Table 21 included some canned salmon besides canned herring and sardines in tomato sauce. Demand for marinated and semi-preserved small pelagic products appeared to be much stronger than that for canned products. However, imports of 'autres preparations et conserves de poissons' fluctuated between 7.8 and 9.6 thousand tons during the 1974-1979 period; judging by the origins, this appeared to be mostly canned tuna, but included some canned sardine (european pilchard) and anchovy products. The Swiss market, like the Dutch, is thought to offer poor prospects for significant increases in export sales of canned small pelagic products in the foreseeable future.

The United Kingdom offers the brightest prospects as a market for expanding exports by emerging and other exporting nations. France, Italy and the Federal Republic of Germany also appear to present limited opportunities in certain market sectors. There countries are analyzed in detail below.

United Kingdom

The British market for canned fish underwent significant changes in the last decade, most imposed by supply considerations engendered by the dependence on imports for nearly all supplies. The market for canned small pelagic products in the United Kingdom is currently in a transition period, adjusting to the disappearance of supplies of canned pilchard products from Namibia and South Africa. These two exporters were the most important suppliers of canned small pelagic products to the United Kingdom until 1978. Primarily because of these developments, Britain is thought to offer significant opportunities for sales expansion or market entry to established and emerging exporters.

Salmon was the most popular product and volume leader in the British market until supplies - all imported - contracted severely beginning 1973, forcing up prices and curtailing consumption. Canned pilchard products - nearly all from South Africa and Namibia - then emerged as the volume leader, although demand for these products was strong for many years. But this market also suffered a severe setback when supplies from South Africa and Namibia suddenly dried up in 1978. Similarly, canned herring products - mostly kippers and sauce packs - enjoyed a steady if restricted popularity in their traditional forms. Supply

problems have pushed up prices and curtailed consumption in recent years. Consumption of canned sardine products (restricted by national labelling regulations to small-size european pilchard), while greater than that of canned herring products, stagnated in recent years because of the lack of growth in import supplies. Import volumes of each of the principal product-types are shown below. They reflect quite accurately the magnitude of national consumption and demand due to the relatively low volume and structure of exports and domestic production of canned small pelagic products.

Table 23

Imports of canned small pelagic products into the United Kingdom
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	25.3	30.2	31.3	32.8	15.8	22.1
Pilchard	13.2	17.7 1/	19.4	20.9	5.4	11.2
Sardine	7.6	8.0	7.4	7.5	7.5	7.6
Mackerel	3.1	3.2	3.1	2.6	1.3	1.4
Herring & brisling (sprat)	1.3	1.0*	1.1	1.4	0.8	1.7
Anchovy	0	0.3	0.3	0.3	0.3	0.3

1/ Includes small quantities of brisling, fish paste and unspecified products.

The volatile supply situation in recent years has forced British traders to look to new and previously less-popular products to fill the gaps in the national supply and demand picture. Their attention is currently focused on the pilchard and mackerel markets. As a result, these markets appear to offer good opportunities for increased sales to British importers by emerging exporters.

Prior to 1978, only south african pilchard and large-sized european pilchard products could be labelled and sold as 'South African Pilchard' and 'Pilchard', respectively. In 1978, japanese pilchard, chilean pilchard and californian pilchard products were permitted and required to be labelled and sold as such, according to new regulations introduced in that year. In 1980, a further modification to labelling regulations was promulgated, designating canned products from these three species as 'Pacific Pilchard', and south african pilchard products as 'South Atlantic Pilchard'. This currently applies only to products marketed in England and Wales, however; the 1978 and earlier regulations still may be applied to pilchard products marketed in other parts of the United Kingdom. The upshot of these complicated modifications is that chilean, japanese and californian pilchards, along with large-sized european pilchard and south african pilchard (effectively out of the picture in the foreseeable future), may now participate in the lucrative British pilchard market. The effect of this development may be seen above in the sharp recovery of canned pilchard imports in 1979. The expansion continued into 1980 as canned pilchard imports during the first seven months of the year were up 22 percent from the level of the same period in 1979. The successful substitution of 'Pacific Pilchard' for the now unavailable south african

pilchard points to increased sales opportunities for Latin American and Asian exporters as British consumers adjust to the new product. Small-sized fish are preferred, both in oil and tomato sauce, and may be packed with skin and bones intact if the fish are not too large.

Current efforts by British traders are also focused on expanding the currently small market for canned mackerel products. Import figures in Table 23 are thought to represent an underestimate of the size of this market after 1976. Although data are sketchy, British production of canned mackerel began to increase in 1977 from previous low levels, concommitantly with the tremendous expansion of national landings of atlantic mackerel, and the contraction in supplies from Japan during 1976-1977. Production is estimated to have been 1200 thousand tons in 1977, and placed at 2400 tons during 1978. Domestic canners, however, have been faced with difficulties in obtaining raw material supplies due to the fact that over 70 percent (in 1979) of British mackerel landings were transhipped directly upon landing, mainly to Eastern European nations. The inability to obtain sufficient raw material supplies necessitated employee lay-offs in some canneries during 1980. In spite of the decline of imports of canned mackerel products since 1976, the problems in the British canning industry, combined with the apparent success in expanding the sales of canned mackerel products of late, indicate opportunities for emerging exporters of canned mackerel products in the British market. All Scomber species may be labelled as 'Mackerel' in the United Kingdom. Brine (water) - and tomato sauce-packed products are apparently the most popular among British consumers.

The restriction by labelling regulations of sardine products to those based on european pilchard, leads to the conclusion that this market offers little opportunity for exporters outside of Europe and the Mediterranean region; This conclusion is reinforced by the fact that the British industry is now pressing for further modification of national labelling regulations to allow canned sprat to be labelled and sold as 'sardine', in addition to small-sized european pilchard products. Sprat and small herring currently must be labelled as 'sild'. If this effort is successful, most future expansion of the sardine market will be filled by domestic and European producers.

Besides expanded domestic production, the sharp rise in prices for imported canned mackerel products during 1977-1979 was no doubt an important factor in the reduced level of imports of these products during this period. During January-July 1980, import prices for these products subsided considerably, and imports of canned mackerel were up 130 percent as compared to the same period of 1979. Prices for canned pilchard products also rose during the period, but moderating levels in 1979-1980 obviously stimulated imports and consumption. A primary reason for the stagnation of imports and consumption of canned sardine products between 1976 and 1979 is that average import prices in 1979 were almost double the level of 1974. Prices moderated in 1980, however, and import volume during January-July of that year was up 17 percent compared to the same period of 1979.

British tariff levels for canned small pelagic products are shown in Appendix C. Tariffs are not thought to present insurmountable obstacles for potential exporters to the United Kingdom. The most difficult problem facing exporters may be the complex and comprehensive regulations governing product composition, permitted additives, colouring agents, antioxidants, preservatives, flavours, standards, labels and the contents and size of label lettering. Exporters are advised to obtain specific details of these requirements from their agents or importers.

France

The volume of French imports of canned small pelagic products during 1979 was exceeded only by that of the United Kingdom among the European nations. While down from the high level of 1974, they registered an almost 25 percent expansion between 1975 and 1979. In spite of the large and growing volume of imports and a high level of consumption of canned small pelagic products, the French market appears to offer limited opportunities for increased exports of these products by exporters, excepting certain West African nations. The structure of French demand, as well as the structure and developments on the supply side of the market point to this conclusion. French production, imports and apparent consumption of canned small pelagic products since 1974 are shown below.

Table 24

Domestic production, imports and apparent consumption of canned small pelagic products - France
(1000 m.t.)

	1974	1975	1976	1977	1978	1979
Production, total	64.8	65.0	59.1	63.0	70.2	71.6
Sardine	31.4	31.4	28.8	31.9	35.9	35.5
Mackerel	27.6	26.3	24.9	28.4	30.4	32.1
Herring & Sprat	2.6	3.5	1.7	0.7	1.0	1.1
Anchovy	3.2	3.8	3.7	2.0	2.9	2.9*
Imports, total	21.2	15.4	17.6	17.4	17.4	19.0
Sardine	16.5	10.9	13.0	11.0	10.6	11.2
Pilchard	0.5	0.7	0.4	1.2	1.4	2.1
Mackerel	1.2	1.0	1.0	1.0	0.8	0.9
Herring	2.4	2.3	2.5	2.5	2.4	2.1
Anchovy	0.6	0.5	0.7	1 7	2.2	2.7
Apparent Consumption 1/	83.3	79.6	75.7	78.7	86.1	89.4
Sardine	47.6	41.9	41.4	42.6	46.1	46.3
Pilchard	0.4	0.7	0.4	1.2	1.4	2.1
Mackerel	27.4	27.0	25.4	28.5	30.5	32.6
Herring	5.0	5 8	4.2	3.2	3.4	3.2
Anchovy	3.4	4.2	4.3	3.4	4.8	5.3

1/ Domestic production plus imports less exports. Exports are not shown as they represented minor volumes - 0.8-2.7 thousand tons total during the period; specifics on the volumes in each year may be seen in section 2.C

Consumption was very high and increased over seven percent during the period. The important factors revealed in these figures, however, were the concentration of consumption in canned sardine and mackerel products - 88 percent in 1979, and the rising level of domestic production - nearly all going to the home market - of these products despite relatively stable national landings of atlantic mackerel and european pilchard. Fresh and frozen imports of these species were used increasingly by French canners to supplement domestic raw material supplies. French labelling regulations restrict the use of the name 'Sardine' and 'Mackerel' to european pilchard and atlantic mackerel products, respectively.

All these facts point to increased domestic production to meet the bulk of any future expansion in demand for canned sardine and mackerel products. While it is true that imports of canned sardine products were substantial, they fell after 1974 and were limited to european pilchard products from established exporters such as Spain and Portugal. Furthermore, the French industry has set up several joint-venture operations in Senegal and Ivory Coast to furnish supply needs in the future. Add to all of the above the exacting French consumer requirements for canned mackerel products - 77 percent of French production in 1978 was packed in wine marinades, only 12 and 11 percent were tomato sauce packs and brine/other packs, respectively, making most mackerel products decidedly 'up market' items - and one must conclude that the canned sardine and mackerel markets in France present many obstacles for entry by emerging exporters. Exporters of european pilchard-based sardine products may be able to expand their shipments to France in the future, but this will be dependent on developments in the French canning industry, which is foreseen continuing and increasing imports of fresh/frozen atlantic mackerel and european pilchard as required to fill most growth in the domestic market demand.

There does appear to be some opportunity for heavier sales of canned pilchard and anchovy products by exporters in the future. While current consumption of these products is comparatively small, imports and consumption of both product-types have increased in recent years. Imports of canned anchovy expanded more than four-fold between 1976 and 1979, while those of pilchard products also increased more than four-fold. The rise of canned anchovy imports was partially the result of declining French production of these products, but it should be noted that over-all demand improved. Oil-packed anchovy fillets were the most popular format, but sauce packs and paté also played a role in the canned anchovy market. Many of these same products, as well as anchovies in vinegar, cream, butter and salt preparation - some of them actually semi-preserved products - were marketed in glass and plastic containers. Canned pilchard imports and consumption - (there was no domestic production of these products) rose from less than 500 tons in 1974 to over two thousand tons during 1979. If the prices of canned pilchard products vis-a-vis those of sardine products remain attractive, this market is expected to offer further opportunities for the expansion of sales by exporters.

French tariff levels for imported canned small pelagic products are shown in Appendix C. Although tariff levels for these imports range between 20 and 25 percent ad valorem of the dutiable value of the product, the chief obstacles to entry into the French market are probably the exacting product quality and presentation standards demanded by French importers, and the precise and mandatory labelling regulations.

Federal Republic of Germany

The Federal Republic of Germany ranked just below France among European nations in canned small pelagic import volume in 1979. German imports exceeded those of France during the preceding four years. Despite this, and a high level of consumption of canned small pelagic products, the Federal Republic of Germany is thought, like France, to have limited prospects of expanding markets.

Annual consumption of canned small pelagic products, as well as import levels of the various products-types between 1974 and 1979 are shown below.

Table 25

Total consumption and imports of canned small pelagic products
Federal Republic of Germany
(1000 m.t.)

	1974	1975	1976	1977	1978	1979
Apparent Consumption 1/	65.7	70.2	75.2	64.7	63.1	58.3
Imports	19.6	22.7	25.0	18.6	19.0	13.8
Herring & sprat 2/	6.2	8.2	8.5	6.7	5.4	7.3
Sardine	9.2	9.2	11.7	7.9	8.7	7.2
Mackerel	3.7	4.9	4.3	3.5	4.4	3.8
Anchovy	0.5	0.4	0.5	0.5	0.5	0.5

1/ Domestic production plus imports less exports
2/ Nearly all herring.

Total annual consumption and import levels dropped substantially after 1976. The reason for this decline may be found in the concentration of German demand on atlantic herring and sardine (again, restricted by labelling regulations to european pilchard) products. These products accounted for the bulk of imports. Herring products accounted for almost all of the substantial domestic production in the earlier years, but its share of the total declined in recent years as supply shortages hit canners. 1/ If national production of marinated and semi-preserved products - 94.5 thousand tons in 1979, utilizing mainly atlantic herring - were included here, the concentration of production and consumption in herring products would be even more apparent. In light of the previously discussed contraction of atlantic herring landings and supplies, the decline of German consumption of canned small pelagic products is not surprising. It has been reinforced by the reduction in landings and supplies of european pilchard, as evidenced by the reduced German imports of canned sardine products.

An energetic search by the German industry for substitutes for canned herring and sardine has been underway since these problems materialized. The objective of this search is not only to fill the gaps in demand, but at the same time to keep the high-capacity and efficient German canning industry operating at an acceptable level of capacity utilization. Frozen raw material, including chilean pilchard and chub mackerel from Latin America, is being imported in quantity. These efforts are expected to fill the bulk of product substitution requirements if atlantic herring stocks recover in a few years as anticipated.

1/ A breakdown of canned output by product-type is not available, but reportedly one-third of 1979 production was atlantic mackerel products. Total annual production figures may be seen in Table 8.

Considerable effort, however, has been made to promote the consumption of canned mackerel products. The focus of these efforts has been on atlantic mackerel products, which accounted for nearly all imports of canned mackerel shown in Table 25. But small receipts of canned mackerel from Japan, the Republic of Korea, China (Taiwan Province) and Peru were reported through the 1974-1979 period. These products appear to offer the best opportunity for greater participation by exporters in the German market. Scomber species may be labelled and sold as 'Mackerel' in the German market, but national labelling regulations are unclear on whether other mackerel species may also use the 'Mackerel' label. It is clear, however, that these products confront very price-sensitive importers. The canned mackerel market is a relatively recently established one in the Federal Republic of Germany, and as such is still considered a 'residual' market by some traders. Because of their recent establishment in the market, canned mackerel products have a considerably lower price elasticity than traditional food products such as herring, and to a lesser extent, canned sardines. Further, canned chub mackerel products bring a lower price than atlantic mackerel products. This fact may translate into opportunities in the German market in the future if prices for canned atlantic mackerel products increase further, and exporters of canned chub mackerel products can keep their prices below those of atlantic mackerel products. In 1978 and 1979, average import values per kilogram of canned chub mackerel products were 75 percent or less - depending on the source - of those for imported atlantic mackerel products.

Tariff levels for imported canned small pelagic products are shown in Appendix C. Neither labelling, health or product-specification standards are thought to represent serious obstacles to exporters in the German market. Importers (who handle an estimated 80 percent of canned fish imports) and central purchasing organizations for retail store groups (who handle most of the balance) are obliged by law to inform foreign exporters of all labelling requirements and the exact German text to be utilized.

Italy

Annual Italian imports of canned small pelagic products between 1974 and 1979 were less than half the levels experienced in the United Kingdom, France and the Federal Republic of Germany. Despite this, and the facts of a growing national canning industry and government policy aimed at diminishing Italy's overwhelming dependence on imports for national fish supplies - fish product imports were the second-largest deficit item in the Italian trade balance after petroleum products - the Italian market is still thought to offer limited opportunities for increased sales by exporters in the future. Apparant consumption of canned small pelagic products as well as imports by product-type are shown below.

Table 26

Apparent consumption and imports of canned small pelagic products - Italy
(1000 m.t.)

	1974	1975	1976	1977	1978	1979
Apparent consumption, total	21.0	14.3	16.8	14.1	17.1	18.3
Imports, total	13.2	7.0	9.2	5.9	8.0	8.6
Sardine	4.0	1.9	2.2	1.5	1.1	1.4
Mackerel	8.3	4.6	6.5	4.2	6.6	6.9
Anchovy	0.8	0.4	0.5	0.1	0.2	0.2
Herring	0.1	0.1	0.1	0.1*	0.1	0.1

Total apparent consumption increased nearly 30 percent after 1975, following the high level of 1974. Imports rose steadily after 1977 with heavier volumes of canned mackerel accounting for virtually all the increase as well as the bulk of total receipts. National production (Tables 6 and 9) of canned small pelagic products expanded almost steadily after 1974, accounting for a larger and larger proportion of total supplies/consumption. Domestic production, its share of total supplies/consumption, and total consumption would all be considerably higher if national output designated only as 'various fish in oil' were included in these computations; production of canned fish in this category rose steadily from 8.2 to 10.5 thousand tons between 1974 and 1979 and is thought to be comprised mainly of mackerel products.

It may be seen that Italian imports of canned sardine and anchovy products declined substantially after 1974 concommittantly with the rise in domestic production of these products (tables 6 and 9). This trend is expected to continue in the future in light of Government policy mentioned previously. Thus, neither the Italian sardine or anchovy markets are thought to offer expanded sales opportunities to exporters in the foreseeable future. The market for canned herring products in Italy was very small and suffered a slight contraction after 1974.

Italian imports of canned mackerel products rose steadily after 1977 despite the apparent grown of national production. Consumption of these products certainly increased after 1977 and ranged between seven and seventeen thousand tons in 1979, depending on what proportion of the unspecified production was mackerel products. Various styles of vegetable oil packs were most popular, but tomato sauce and brine packs are also in demand. These products are viewed like canned tuna - primarily as a meal ingredient, rather than as antipasti (sardine and anchovy products). Consumption of mackerel products is apparently concentrated among low and middle-class consumers, while tuna is more popular among upper-income groups. The mackerel market, unlike that for tuna products, is not characterized by heavily promoted brands and a high degree of brand loyalty among consumers. These factors should facilitate entry by new exporters.

As a result of the tremendous increases in the prices for Portuguese mackerel products between 1974 and 1977, imports from this country dropped almost 25 percent during that period. The moderation of prices in the following years resulted in a recovery of Italian imports from Portugal in 1978 and 1979; they were 11 percent above the 1974 level by 1979. Receipts from Japan, on the other hand, declined almost steadily between 1974 and 1978 (1979 data are not available). This clearly indicates the strong preference for atlantic mackerel products in the Italian market, and highlights a serious obstacle facing established and potential exporters of chub mackerel products.

Africa

Aggregate annual imports by Nigeria, Egypt, Zaire and Ghana advanced at least 130 percent between 1974 and 1976, but apparently 1/ retreated in recent years. In 1976 and 1978, the volume of canned small pelagic products going through international trade channels to these four countries eclipsed that going to Europe and Scandinavia. By 1979, receipts by these African nations accounted for an estimated 16 percent world trade volume, down from

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1/ See Table 21, footnote 1.

22 percent in 1976. Nigeria was by far the largest importing nation in Africa, but receipts apparently contracted during 1979. Imports by Zaire contracted steadily during the period, and in 1979 were well down from previous-year levels. Receipts by both Ghana and Egypt rose rapidly through 1976, apparently dropping substantially in recent years. The volatility of annual import levels in these countries presents considerable difficulty in evaluating future import demand, but they should continue to represent very significant outlets for exporters of canned small pelagic products. The national markets in each of these countries are examined in the following pages.

Nigeria

Nigerian imports of canned small pelagic products increased from slightly more than seven thousand tons in 1974 to at least 90 thousand tons in 1978. Nigeria was the heaviest importer of these products during 1976, 1977 and 1978; in the latter year Nigerian receipts accounted for nearly 20 percent of world trade volume. Available data describing Nigerian imports are provided below. Imports may be effectively equated with apparent consumption as national production and exports were negligible.

Table 27

Imports of canned small pelagic products - Nigeria
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978 1/	1979 1/
Total	7.4	22.6	46.4	68.4	90.0	69.7
Sardine	3.7	13.0	31.5	30.1	25.8	16.5
'Other' (mackerel)	3.6	9.6	14.9	38.3	65.1	53.2

1/ Official Nigerian trade data for these years are not available; data represents reported shipments to Nigeria by major exporters.

Imports and consumption expanded very significantly during the period, beginning 1975. A primary reason for tremendous growth was the long-lasting drought in north-central Africa in the 1970s which hit with severity during the middle years of the decade. As a result of the drought, beef and poultry prices increased very sharply, thus stimulating the demand for and consumption of fish products. As may be seen, the demand for canned fish was a major beneficiary of the substitution of other protein sources for beef and poultry. The apparent reduction of consumption during 1979 is thought to be evidence of the moderation of drought effects on beef and poultry supplies and prices, and the return by consumers to previous consumption habits. Nigerian demand for canned small pelagics in recent years was concentrated in mackerel products. Tomato sauce-packed mackerel was by far the most popular product-type, accounting for an estimated 86 and 98 percent of exporters' shipments to Nigeria in 1978 and 1979, respectively. Brine (or water)-packed mackerel were also known to have been received. Receipts of chub mackerel products from Japan accounted for nearly all supplies, but Morocco, Singapore and Thailand also shipped some mackerel products to Nigeria. Although data are not available, Peru and Chile apparently shipped volumes of mackerel products to Nigeria in recent years.

Imports and consumption of canned sardines apparently declined steadily after 1976. This category appeared to include european pilchard (the most important), japanese pilchard (most of the balance), as well as chilean pilchard and some atlantic herring and anchovy products. The tomato sauce-pack again appeared to be among the more popular product-types, but oil and other packs appeared in receipts. Spain supplied most of these products to the Nigerian market in recent years, but Japan, Singapore and possibly Peru and Chile furnished small quantities.

An indication of the trends and levels of prices for canned sardine and mackerel products in the Nigerian market may be obtained from the reported per-kilogram values of exports of these products to Nigeria. These are shown below. Actual prices in Nigeria are not available.

Table 28

Per-kilogram values of Japanese and Spanish exports to Nigeria

	1974	1975	1976	1977	1978	1979
Tomato sauce-packed mackerel (Japan in yen)	226	212	239	284	237	224
Sardine (Spain in pesetas)	48.2	60.3	67.6	83.8	102.7	100.7

An important reason for the apparent decline in imports and consumption of sardine products, and their partial replacement by mackerel products may be seen above. Spanish export prices for canned sardine products increased sharply, especially during 1977 and 1978. Export prices for Japanese mackerel products registered increases during 1976 and 1977, when Japan's export supplies of these products contracted, but have subsided again in recent years, stimulating Nigerian imports.

In general, Nigerian demand for lower-priced products is foreseen remaining quite strong, with good opportunities for exporters of these products. Future developments in supplies and prices of beef and poultry merit close attention, however, as market improvements in these sectors could very well cut into the demand for canned sardine and mackerel products. Further, Nigeria's success in implementing its large development plan for the domestic fishing sector also merits close watching as this plan is aimed at reducing Nigeria's dependence on imported fish products. Nigeria is thought to have substantial small pelagic resources off her shores, although current levels of exploitation are low.

The duty rate on all canned fish is only five percent ad valorem of the C.I.F. value. In addition, a surcharge of five percent of the C.I.F. value is assessed. Health, product specification and labelling standards do not represent serious obstacles to exporters, but payments by letter of credit are subjected to a 100 percent advanced deposit requirement.

Egypt

Annual imports of canned small pelagic products by Egypt fluctuated widely between 1974 and 1979. While the volume in the latter year was down an estimated 1/ 50 percent from 1978

1/ See Table 21, footnote 1.

it represented an at least eight-fold expansion when compared to the volume of 1974. Imports as shown in Table 21, may be effectively equated with apparent consumption, as domestic production and exports of these products were negligible.

A breakdown of Egyptian imports by product-type is not available, but Japan appears to have furnished nearly all imported supplies to the Egyptian market. Examination of reported Japanese shipments to Egypt reveals mackerel packed in brine (or water) to be the overwhelmingly most popular product in the Egyptian market. Small quantities of oil-packed and tomato sauce-packed mackerel were also imported, however. Significant quantities of canned sardine products, from Japan as well as Spain, were also imported in some years. The oscillation of import levels was indicative of the discontinuity of demand in the Egyptian market. This was due to the fact that import levels were and are more a function of the availability of foreign exchange than demand as dictated by market forces. Egypt has a global import programme for fish products based on the availability of foreign exchange. With its large population, Egypt offers the potential of being a large market for canned small pelagic product exports as its foreign exchange position improves.

Tariff levels for canned sardines are only two percent of C.I.F. import values; the rate for other canned fish products is only one percent. An 'Economic Development Tax' and 'Statistical Tax' of five and one percent, respectively, of the C.I.F. value is also assessed. As mentioned previously, however, the over-riding factor in the determination of import levels is the global import programme for fish products, based on available foreign exchange. Health, product specification and labelling standards are not exacting. Though imports may be handled by private companies, the bulk of fish imports are handled by the Fish Marketing Company, a public company with storage and marketing outlets nation-wide.

Zaire

Annual imports of canned small pelagic products into Zaire were very heavy during the 1974-1976 period, but recorded substantially reduced levels in recent years. The severe drought in north-central Africa during the earlier years of the period is thought to have been an important factor in stimulating the heavy imports of these years. Receipts apparently declined as the effects of the drought on the supplies of other food items moderated, and foreign exchange availability came to the fore in Government policy with respect to import levels. Zaire is expected to remain a strong and large market for canned small pelagic product exports in the future, but the magnitude of purchases will continue to be dependent on foreign exchange availability.

Available data describing Zaire's imports of canned small pelagic products between 1974 and 1979 are provided below. As in Nigeria and Egypt, import volume may be equated with apparent consumption as Zairian domestic production and exports of these products were negligible.

Table 29

Imports of canned small pelagic products - Zaire
(1000 m.t. reported weight)

	1974	1975	1976	1977 2/	1978 2/	1979 3/
Total	32.2 1/	21.5	27.1	15.9	11.4	2.8
Sardine	....	3.5 2/	5.3	4.2	3.8	1.3
Pilchard	....	12.6 2/	21.8	11.5	7.5	0.8
Mackerel	....	....	....	....	....	0.7
Herring	....	0 2/	0	0.1	0	....

1/ Thought to include quantities of canned salmon and other prepared and preserved products.
2/ Official but incomplete reports.
3/ Reported shipments by major exporters to Zaire; thought to represent an underestimate

Canned 'pilchards', mainly from Japan, Peru and Brazil accounted for most receipts. Prior to 1978, Namibia and South Africa were the principal suppliers of canned small pelagic products to Zaire; during 1976 these countries accounted for nearly 60 percent of Zaire's import supplies. The withdrawal of Namibian and South African supplies were no doubt another important factor in the contraction of Zaire's imports after 1976. Peru entered the market in some force during 1978, indicating the opportunities for emerging exporters in Zaire to fill the gap left by the Namibian and South African withdrawal. Fragmentary information indicates pilchards packed in tomato sauce to be the most popular product-type.

Annual imports of canned sardines were relatively stable during the period. These were nearly all european pilchard products, supplied by Spain (the most important), Portugal, Morocco and a few other smaller exporting countries. Oil-, and tomato sauce-packed products, as well as other specialty packs, appeared in exporting countries' reported shipments to Zaire.

Canned mackerel products were not broken-down in the official trade data of Zaire. Some quantities of tomato sauce-packed product did appear in shipments to Zaire reported by exporting countries. The volumes received - the magnitude of which are unknown - are thought to be included with pilchard and sardine products due to the structure of duties on imported canned fish products in Zaire (see below). Canned mackerel products could represent another market sector with potential for absorbing greater sales volumes by exporters in the future.

Health, product specification and labelling standards for canned fish products marketed in Zaire are not exacting. Canned herring, sardine and pilchard products, as may be seen in Appendic C, enter Zaire duty free; other canned fish products are assessed a ten percent ad valorem duty based on the C.I.F. value of the product. Import volume, however, is regulated through the licensing of these goods by the Department of National Economy in cooperation with the National Bank, and the assessment of a 'Fiscal Duty' ranging from ten to 90 percent of the C.I.F. value of the imported goods. Additionally, a three percent ad valorem 'Statistical Tax' (on C.I.F. value) is assessed on imports.

Ghana

Although data are incomplete, 1/ imports of canned small pelagic products by Ghana apparently declined substantially during the 1977-1979 period from the high level of 1976. In that year, Ghana ranked as one of the largest importing nations in the world. This is thought to have been due to the severe drought which affected most of northern and central Africa. Receipts contracted substantially in subsequent years, the reasons for which lead to the conclusion that Ghana, while it will continue to be an import market of some size in the future, will not again revert to the heavy dependence on imports exhibited during 1976.

An important reason for this conclusion is the large and developing domestic fishing industry. Ghana is one of the largest producers of small pelagic species among the countries of West Africa (Appendix Table A-2). Sardinellas, anchovies and other species suitable for canning predominate in these landings. Efforts are continuing to develop the domestic canning industry to supply the bulk of home market needs in the future. This objective is supported by Government policy affecting imports. Ghana prohibits the import of fish products which represent a threat to domestic production, while imports of other products are strictly regulated by the Controller of Imports. A duty of 35 percent ad valorem, C.I.F., is assessed on all canned fish imports. All imports are subject to a prior deposit requirement of up to 65 percent of the C.I.F. value of the goods, depending on the current foreign exchange position. Furthermore, all imports must be licensed by the Controller of Imports, who is empowered to regulate or license the import of all goods. Imports can only be made by importers which have been duly registered by the Ministry of Trade and Tourism; most imports, however, are channelled through the National Procurement Agency (NPA), a government-controlled organization. All these tools are utilized to restrict imports when deemed necessary.

Asia

Shipments of canned small pelagic products to the five major importing countries of Asia advanced strongly through 1976, then retreated the following three years. Imports by these nations during 1979 were estimated to be more than 20 percent below the level of 1974, but still accounted for about 13 percent of total trade volume in the most recent year. The Philippines remained the leading importer in the Asia region, but receipts by this country experienced a substantial decline after 1975. Annual imports by Malaysia doubled between 1974 and 1979, making it the second most important import market in the region by the latter year. Singapore and Indonesia were the other leading importing nations in Asia during most of the period, but receipts by both countries contracted substantially in recent years. A significant portion of Singapore's imports were re-exported as part of that nation's important role as an entrepôt in Asia; but a larger portion was retained for local consumption. The liberalization of import regulations by Sri Lanka in 1977 resulted in a growing inflow of canned small pelagic products beginning that year.

Although it still represents a very significant market for canned small pelagic products, the Philippines is covered only briefly here. Due to the rapid growth of the national canning industry beginning in 1977, Philippine imports of canned mackerel (most of the volume shown in Table 21) and sardine (nearly all the balance) are expected to continue contracting sharply. Beginning 1977, a diminishing annual quota has been placed on canned sardine and mackerel imports to support the local canning industry. Recent price surveys showed domestically-produced products to be cheaper than imported varieties, and local products increasingly gaining acceptance among consumers. By 1979 some 31 fish canning

1/ See table 21, footnote 1.

firms filled an estimated 60 percent of market demand as compared to less than one percent during 1974. Filipino producers now claim to have sufficient canning capacity to satisfy 100 percent of domestic market requirements, and resources of small pelagic species suitable for canning are abundant in Philippine waters. The Philippine Fish Marketing Authority is now contemplating the canning industry's inclusion on the Board of Investment's list of over-crowded industries.

Indonesia presents a picture similar in some ways to that in the Philippines. Endowed with very substantial small pelagic resources around its shores, it too was once a large import market for canned products utilizing these species. Over 21 thousand tons were imported during 1976, but by 1979 receipts had declined to an estimated four thousand tons (Table 21). This was due to various measures instituted by the Government to implement a policy aimed at keeping out foreign fish products and preserving foreign exchange. A 70 percent duty was imposed on imported canned fish products based on 'check' prices reflecting C.I.F. values. Additionally, a 5.1 and 20 percent sales tax is levied on the C. & F value plus import duty. At the time of opening of letters of credit, an advanced import deposit of at least 40 percent is required plus an additional 100 percent financial guarantee deposit and the advance payment of customs duty. All imports of fish products require approval from the Directorate of Import, Ministry of Foreign Trade, and canned fish products must be registered with the Directorate General of Medicines and Food Control, Department of Health, prior to receiving an import license. Importers must be registered, and only Indonesia nationals may obtain an importer's license.

Among other countries in Asia, reported Japanese shipments in 1979 (Table 22) reveal Hong Kong, Vietnam, Thailand and Laos to have imported notable volumes of canned sardines and mackerels. Much of Hong Kong's receipts, like Singapore's were re-exported; the quantities, however, were much lower. Little information is available describing current market conditions in Vietnam and Laos. Thailand received small volumes, but that nation imposes a high 30 percent ad valorem duty plus several surcharges totalling 11.5 to 17 percent - all on C.I.F. value - to discourage imports and protect the growing national canning industry. India follows similar practices, including a 100 percent duty on imported canned fish; the objective here is to conserve foreign exchange and protect the infant national canning industry.

Malaysia, Singapore and Sri Lanka are examined in more detail below.

Malaysia

By 1979 Malaysian imports of canned small pelagic products are thought to have actually exceeded those of the Philippines. (Only receipts by Peninsular Malaysia and Sabah are shown in Table 21; receipts by Sarawak were not available). Import volume in that year represented a two-fold expansion over receipts in 1974. Imports by product-type for Peninsular Malaysia and Sabah are shown below.

Table 30

Imports of canned small pelagic products Peninsular Malaysia and Sabah
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979 1/
Peninsular Malaysia, total	7.9	9.2	11.3	10.8	11.5	16.8
'Horse Mackerel'	5.2	7.4	7.0	5.3	6.7	11.1
Sardine 2/	2.7	1.8	4.3	5.5	4.7	5.7
Sabah, total	2.0	2.3	2.3	2.0	2.7	3.0
'Horse mackerel'	1.5	2.0	1.9	1.5	1.5	1.4
Sardine	0.5	0.3	0.4	0.5	1.2	1.6

1/ Official trade data for 1979 were not available. Data represent reported shipments to Peninsular Malaysia and Sabah by major exporters.
2/ Includes small quantities of 'herring' and 'brisling'.

Consumption of these products in Peninsular Malaysia was certainly greater than import volumes shown in Table 30. As in the Philippines, a fledgling canning industry was establishing itself in Peninsular Malaysia during this period. Production levels were not reported, but exports rose from 200 tons in 1974 to almost three thousand by 1978 (Appendix Table A-3). Imports effectively reflected apparent consumption in Sabah. Import (and consumption) levels in Sarawak were thought to be similar in structure and magnitude to those in Sabah.

Imports and consumption of canned small pelagics in Peninsular Malaysia were dominated by mackerel products. This also was true in Sabah until 1977, but recent years have witnessed the growing popularity of canned sardine, challenging that of canned mackerel. Sardine products also experienced growing popularity in Peninsular Malaysia, but imports remained at about one-half the volume of canned mackerel receipts during the period. Tomato sauce-packed fish appears to account for nearly all Malaysian imports and consumption of both sardine and mackerel products. Japan provided almost all the import requirements of both these product-types, but small quantities were received from Morocoo, Norway, Singapore, Canada, China and a few other countries. Very small receipts of canned herring, sprat, pilchard and saury were also reported.

The reported average per kilogram values of Peninsular Malaysian canned sardine and mackerel receipts are shown below.

Table 31

Average per kilogram values of canned sardine and mackerel imports - Peninsular Malaysia
(M$ C.I.F. Value)

	1974	1975	1976	1977
Sardine	1.47	1.43	1.78	2.21
Mackerel	1.85	1.81	1.70	2.13

Malaysia pursues a liberal fish import policy due to the strong national demand which cannot be fully satisfied by local supplies. Canned fish products may enter the country duty-free. They are subject to regulations if any chemical additives are utilized, and are subject to specific labelling requirements. Many of these are not published and should be ascertained from agents and importers in Malaysia. These individuals handle marketing corporations.

With its growing demand, bolstered by one of the stronger and more dynamic economies in Asia, Malaysia represents one of the bright prospects among the major import markets for canned sardine and mackerel products. No serious obstacles to this trade currently impede the inflow of foreign products.

Singapore

In contrast to Malaysia, imports and consumption of canned small pelagic products in Singapore declined substantially after 1975. While a renewed expansion of imports of these products is not considered likely, Singapore is expected to remain an important market for exporters of certain product-types in the foreseeable future.

Imports, exports and apparent consumption of canned small pelagic products in Singapore since 1974 are shown below. (Domestic production is still comparatively small and a minor element in this picture).

Table 32

Imports, exports and apparent consumption of canned small pelagic products - Singapore
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Imports, total	21.0	26.0*	19.3	17.0	16.2	10.9
Sardine 1/	7.9	....	7.6	8.1	8.5	7.2
Horse mackerel	13.0*	....	11.6	8.9	7.7	3.5
Anchovies 2/	....	....	....	....	....	0.2
Exports, total	4.8	7.0*	7.7	7.9	9.1	4.9
Sardines 1/	2.4	....	2.7	5.5	3.3	2.5
Horse mackerel	2.4 3/	....	5.0	2.3	5.8	2.3
Apparent Consumption	16.2	19.0*	11.6	9.1	7.1	6.0
Sardine 1/	5.5	....	4.9	2.6	5.2	4.7
Horse mackerel	10.6	....	6.6	6.6	1.9	1.2
Anchovies 2/	....	....	....	....	....	0.1

1/ Includes small quantities of canned herring and sprat.
2/ 'Ikan bilis.'
3/ Includes small quantities of other canned products.

Declining consumption of canned mackerel products was clearly the reason for the more than 60 percent contraction of apparent consumption of canned small pelagic products in Singapore between 1974 and 1979. Consumption of sardine products, on the other hand, was relatively stable during the period except for 1977 when exports jumped sharply higher. Tomato sauce-packed products apparently accounted for nearly all canned sardine usage in Singapore. Japan furnished most (96 percent in 1979) import supplies, but several other countries in Asia and Europe, as well as Peru, supplied small quantities. This represented a significant change from earlier years when South Africa accounted for most receipts of sardine (pilchard) products by Singapore. By 1976, however, Japan was vying with South Africa and Namibia for the position of the leading export supplier to Singapore, and had consolidated its position by 1977. South Africa and Namibia were forced to effectively withdraw from the market the following year.

Average per-kilogram values reported for sardine receipts from Japan are provided in Table 33. Price data for Singapore are not available.

Table 33

Average per-kilogram values of Japanese canned sardine product imported by Singapore
(S $)

	1974	1975	1976	1977	1978	1979
Import value F.O.B.	2.08	....	1.91	2.18	2.04	1.95

The apparent increase in price levels during 1977 may have been a factor in the contraction of consumption of canned sardine products in that year. Consumption recovered during 1978-1979 when prices subsided.

As a free port, no impediments to the inflow of foreign canned fish are imposed by Singapore. Product enters duty-free. There are no health, product specification or packaging standards established, but canned fish products must comply with Singapore Marking and labelling standards enforced by the Import Division of the Department of Trade and Resources. In general, however, Singapore is expected to remain a relatively important and stable outlet for canned sardine exports in the future. It appears that consumption of canned mackerel products will not recover.

Sri Lanka

Import data for Sri Lanka are not available. Shown below and in Table 21 are reported shipments of canned small pelagics to Sri Lanka by major exporters. (Domestic production and exports of these products were nil).

Table 34

Shipments to Sri Lanka of canned small pelagic products as reported by major exporters
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	0	0	0.6	6.3	3.3	9.2
Sardine	0	0	0.5	-	-	1.2
Mackerel	0	0	0.1	6.3	3.3	8.0

As may be seen, canned mackerel products have rapidly become the most important element in the Sri Lankan market. The brine or water pack appears to be the overwhelmingly most popular product-type; this preference seems to hold in sardine products as well. Some tomato sauce-packed mackerel and sardine products also appeared in exports destined for Sri Lanka. Japan was again by far the most important supplier to this market according to available data. Singapore and Thailand were also represented, but the ultimate origin of shipments from Singapore are unknown. These products have helped fill a large gap in Sri Lankan fish supplies which developed after the early 1970s when supplies of the previously popular dried fish contracted substantially and domestic fish production was insufficient to meet market requirements. With present Government policy of allowing the market to dictate import requirements, Sri Lanka should present increased sales opportunities in the future for canned small pelagic exporters, particularly mackerel products. These products currently enter Sri Lanka duty-free. Special labelling requirements do pertain, and goods should be packaged in the heaviest of packing cases due to the fact that transhipments are frequently necessary.

North and Central America and the Caribbean

Excepting 1974, this region ranked just below Asia as a destination in the flow of canned small pelagic products through world trade channels. Four countries accounted for most receipts in the region and about ten percent of world trade volume in 1979. During 1974, these countries accounted for over 18 percent of world trade volume. The United States was by far the largest importing country of the four, and a significant drop in American receipts was the reason for the decline in aggregate imports into the region between 1974 and 1979. Jamaica and the Dominican Republic, followed by Canada, were the other large importing nations in North and Central America and the Caribbean.

Among other nations in the region, Mexico represents a very significant market for canned small pelagic products, but this country is not examined in detail here. Virtually all Mexican demand was supplied by the large and growing domestic industry; between 1974 and 1979, national production expanded 44 percent (Appendix Table A-3), most of this being canned Monterrey sardine. Government policy ostensibly prohibited the import and export of canned sardines - although small quantities of canned sardine and other products were, in fact, imported and exported by Mexico - and is aimed at encouraging domestic production to fill the growing needs of the national market. Mexico has very significant resources of small pelagic species off her shores, but recent strong pressure on the market has led to consideration of allowing some imported product to augment domestic supplies. Mexico, however, is not expected to represent an important outlet for world exporters of canned small pelagic products in the foreseeable future.

Most of the other nations in this region imported small volumes of canned small pelagic products (see Table 22). None of these other nations represent a market of significant size and are consequently not examined here. In aggregate, however, they do offer real potential as outlets for the growing export supplies of emerging exporters in Latin America, especially in the replacement of higher-priced imports from Europe and Asia.

The Canadian market is not examined in detail here. Imports by this nation were quite stable between 1974 and 1979 (Table 21). After declining steadily for some years, Canadian production of canned small pelagics (mostly herring/sardine products) exhibited an impressive expansion between 1976 and 1979 (Appendix Table A-3), spurred by the claiming of a 200-mile EEZ by Canada in 1977. The bulk of future increases in Canadian demand are expected to be filled by the domestic canning industry.

United States

Although a large market, the United States is an extremely competitive one. The market for canned fish is overwhelmingly dominated by tuna, although salmon is also important. Small pelagic products play comparatively small and diminishing roles in the American market for canned fish. This fact, in combination with the highly competitive nature of the market (competition coming from domestic product as well as from entrenched, long-established imported products) makes for limited opportunities for expanded sales of canned small pelagic products by exporters in the future, and problems in market entry by emerging exporters.

Production, imports, exports and apparent consumption of canned small pelagic products in the United States since 1974 are described in Table 35.

Table 35

Production, imports, exports and apparent consumption - The United States
(1000 m.t. net product weight)

	1974	1975	1976	1977	1978	1979
Production, total	15.7	18.1	17.4	29.9	28.8	27.3
Sardine	11.4	11.8	11.3	10.7	12.0	13.8
Herring and herring specialities	2.5	1.8	3.0	3.0	2.1	1.6
Mackerel	1.7	4.4	3.0	14.8	14.7	11.9
Anchovy	0.1	0.1	0.1	1.4	0	0*
Imports, total	70.9	33.5	48.1	30.6	34.3	36.0
Sardine	31.5	16.9	24.4	18.8	22.1	22.6
Herring	7.3	5.6	5.5	4.9	3.5	3.2
Mackerel	29.9	9.4	16.0	4.4	6.6	8.6
Anchovy	2.2	1.6	2.2	2.5	2.2	1.6
Exports, total	0.9	1.2	1.1	1.1	5.0	4.5
Sardine	0.8	0.9	0.8	0.5	0.7	0.7
Mackerel	0.2	0.3	0.2	0.6	4.3	3.8
Apparent consumption 1/	85.7	50.4	64.4	59.4	58.1	58.8
Sardine	42.7	27.8	34.9	29.0	33.4	35.7
Herring	9.2	7.4	8.4	7.9	5.6	4.8
Mackerel	31.4	13.5	18.8	18.6	17.0	16.7
Anchovy	2.3	1.7	2.3	3.9	2.2	1.6

1/ Domestic production plus imports less exports.

Although quite stable during the 1977-1979 period, apparent consumption of canned small pelagics fell after 1974. This actually represents a continuation of a long-term down-trend in American consumption of these products experienced over the last 35 years. An apparent change in the long-term picture, however, was the reversal in the trends of domestic production and total imports, and the expanding share of the total market claimed by domestic products. National output of 'Maine sardines' registered a moderate increase during the period. Whether this will continue, however, is unclear as this output is presently based only on catches made in a restricted area off Maine, the landings of which

are carefully regulated to preserve stocks. The sharp rise in canned pacific jack mackerel output, beginning in 1977, was the most significant development in the national production picture. By 1979, domestic products accounted for fully 46 percent of total supplies and apparent consumption of canned small pelagic products, as opposed to a 19 percent share during 1974. If this trend continues, hopes of expanding export sales in the United States will be very slight.

Annual apparent consumption levels of all small pelagic product-types recorded declines in 1979 as compared to 1974. Canned sardine, the largest market sector, witnessed an increase in demand and consumption after 1977, however. The substantial decline in consumption during 1975 was attributed to the sharp increases in retail prices, both absolute and relative to other fish and protein products, during late 1974 and 1975, as well as to declining consumer purchasing power caused by the recession in the United States during that period. Prices continued to register strong advances after 1977, but consumption and imports increased significantly during 1978 and 1979 nonetheless. The import market was about evenly divided between oil-packed sardines - supplied mainly by Norway (47 percent in 1979), Canada (14 percent), Portugal (15 percent), Yugoslavia (nine percent) and Spain (five percent) - and other packs, chiefly the tomato sauce packs. Norway, Namibia and South Africa supplied the bulk of this latter product-type through 1977, but the withdrawal of South Africa and Namibia and the reduction in Norwegian export supplies opened up the market to other suppliers in recent years. By 1979, Peru was the most important supplier of these products (45 percent), followed by Norway (22 percent), Japan (13 percent) and Mexico (12 percent). This turn of events clearly shows that although total import volume of canned sardine products may not expand much in future years, opportunities for emerging exporters will continue to arise in the American market as established export suppliers experience resource of production-cost problems. Indeed, if Norway - the single largest foreign supplier of canned sardine (actually, juvenile atlantic herring) products to the American market in recent years; this nation furnished 34 percent of total canned sardine imports in 1979 - experiences further difficulty with herring supplies as anticipated, additional opportunities for increased sales by emerging or established exporters may very well materialize in the American canned sardine market in the future.

The canned mackerel market is the other sector of the American market for canned small pelagic products which appears to offer some opportunity for increased future sales by exporters. Significant changes on the supply side of this market occurred after 1974, as national production jumped sharply higher in 1977-1979, forcing down the previously very sizable imports of these products. Apparent consumption of canned mackerel contracted slightly after 1976, but import volume began to recover in recent years from the low of 1977. In that year, much heavier domestic supplies first hit the market, but subsequent years witnessed the direction of substantial quantities of domestic product to export markets. Imports again moved in to fill the gap. Brine- and tomato sauce-packed mackerel apparently dominated this market, but oil-packed mackerel enjoyed some popularity. In 1979, Peru was the most important foreign supplier (46 percent of total receipts), followed by Chile (18 percent), and Japan (13 percent). Numerous other countries supplied small quantities. This contrasted sharply with 1974, when Japan furnished fully 90 percent of the very heavy receipts, again indicating the opportunities available to emerging exporters in the American market for canned small pelagics. This substitution of suppliers by American importers also highlights the price sensivity of importers and consumers of canned mackerel products. Canned mackerel ranks among the lowest-priced of canned fish products in the American market, and is most popular among low and middle-income groups. In 1979, import value per kilogram of Japanese canned mackerel was almost double the level of Peruvian

products. Opportunities for increased export sales in the future, however, will be dependent on developments in the domestic mackerel canning industry; if its production declines further (1979 output was down almost 20 percent from the previous year), or its focus on exports intensifies, increased sales opportunities for exporters of canned mackerel products in the American market are very likely to materialize in the coming years.

The trends in prices for canned mackerel and sardine products since 1974 are shown below.

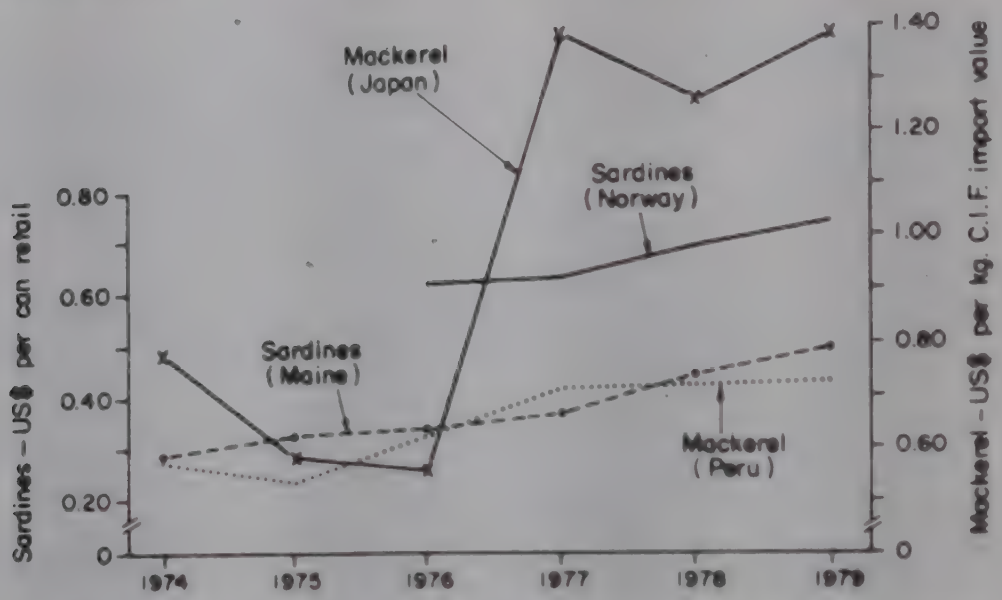

Fig. 6 Trends in canned sardine retail prices and per kilogram import value of canned mackerel

(Source: National Marine Fisheries Service)

Value trends for imported mackerel products clearly indicate other important reasons, beside the expansion of national output, for the sharp drop in imports of these products in 1977, and the replacement of Japan by Peru as the principal export supplier. Retail prices for both domestic and imported canned sardine products increased steadily during the period. Retail prices for Maine sardines in 1979 were up more than 80 percent as compared to 1974. These data, however, illustrate the resilience of the sardine market: apparent consumption of these products rose 23 percent during 1978-1979 despite a 36 percent advance in prices during this period.

The complex tariff structure relevant to canned fish products is shown in Appendix C Attachment A. Additionally, sales taxes ranging up to 12 percent are levied on imported goods by state and municipal bodies. Exacting and strictly enforced health, product specification, labelling and packaging standards are difficult obstacles facing exporters of fish products wishing to participate in the American market.

Jamaica

Jamaica is the largest import market for canned small pelagic products in the Caribbean. Total receipts during the 1974-1979 period did not fluctuate widely except in 1977, when the volume dropped to about one-quarter of the levels of previous and subsequent years. The Jamaican market could present opportunities for future export sales over-and-above current levels, but this will depend on the national availability of foreign exchange and the success of present government policy to reduce its dependence on foreign imports by developing the domestic fishing industry.

The Jamaican market is dependent on foreign product for virtually all its supplies of canned small pelagic products through 1979. Annual import volumes between 1974 and 1979 are shown below. (Exports were very low during this period).

Table 36

Imports of canned small pelagic products - Jamaica
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979 1/
Total	9.4	6.8	9.8	2.0	7.4	9.4
Sardine	2.9	....	3.0	1.1	3.2	1.7
Mackerel	4.7 2/	3.2 2/	5.4	0.3	3.7	7.7
Herring	1.8	....	1.4	0.7	0.5	....

1/ Official trade data for 1979 was not available. Data represent reported shipments to Jamaica by major exporters.

2/ Japanese export data; Japan supplied nearly all Jamaican imports of mackerel products during the period.

Total apparent consumption - equated here with imports - ranged between 6.8 and 9.4 thousand tons during the period, except in 1977. Only in that year did canned mackerel products fail to account for the bulk of supplies and consumption. By 1979, when canned mackerel receipts were heaviest, the tomato sauce-pack represented nearly all import and supply volume. Small quantities of mackerel packed in brine or water also appeared in receipts. Japan furnished fully 98 percent of canned mackerel imports in 1978, and was the only country reporting shipments to Jamaica in 1979 (according to available data).

Supplies and apparent consumption of canned sardine products fluctuated between 1.1 and 3.2 thousand tons between 1974 and 1978; (indicated data for 1979 are probably incomplete). A significant change in the import supply pattern for these products occured during the period. While Canada and the United Kingdom furnished virtually all supplies in the earlier years, by 1978 the United Kingdom had dropped out of the picture and receipts from Canada were exceeded by those from Yugoslavia (the largest), Japan and Brazil. Bulgaria also supplied small quantities. Surprisingly, Latin American exporters were represented by only very small volumes.

Although no price data are available for Jamaica, available data indicate the market for all canned small pelagic products was quite sensitive to price changes. This conclusion is reinforced by observation of the difficult economic conditions in the country in recent years. It is significant that canned mackerel imports dropped to a low level during 1977, a year when Japanese export supplies contracted substantially and prices escalated.

Although the tariff on canned sardine, herring and mackerel products is only three percent ad valorem of C.I.F. value (a 'Tonnage Tax' according to weight and a Surtax varying form 10 to 20 percent of customs duties are also assessed), materialization of an expanded market for export supplies in the future is thought to be dependent on foreign exchange availability and the Government's success in encouraging the development of a local canning industry. Foreign exchange restrictions are implemented through the licensing of imports by the Board of Trade and Industry. The State Trading Agency of Jamaica has been gradually taking over the import of all fish products, but the future Government policy on this and other institutional matters discussed above merits close attention with the installation of a new government during 1980 with a decidedly more private enterprise-oriented philosophy.

Dominican Republic

Only fragmentary information is available describing developments in the Dominican Republic. Available data, however, indicates a growing market for canned small pelagic products. Domestic output and exports of these products were thought to be nil between 1974 and 1979. Available import data are summarized below.

Table 37

Imports by and reported exports of canned small pelagic products to the Dominican Republic
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	1.9	3.7	0.7	5.5 2/	4.7 2/	5.0
Mackerel 1/	1.9	3.7	0.7	1.9	2.3	1.8
Sardine 1/	-	-	-	2.9	0.5	3.2

1/ Reported exports to the Dominican Republic by Japan.
2/ Imports of 'fish products and preparations, whether or not in air-tight containers', as reported by FAO.

These data indicate imports and apparent consumption of canned small pelagic products increased during the period, and that both canned sardine and mackerel are popular among consumers. Japan apparently supplied most import supplies - chiefly tomato sauce-packed mackerels and sardines; and shipments to Jamaica did not appear in export reports of other major exporting countries. No such data, however, were available for Peru and Chile, the two largest exporters in Latin America.

No price data are available for the Dominican Republic, but the market is no doubt quite price sensitive in the light of Government measures to control foreign exchange. The Central Bank imposes control through the issuance of exchange licenses, which are necessary in order to remit exchange to cover imports. The only exception to this is when the goods are paid for from the importer's own foreign exchange; in this case no control measures apply. Duties are US$ 0.20/kg. for sardine products, US$ 0.35/kg. for anchovy fillets and US$ 0.20/kg. for other canned small pelagic products. Additionally, an internal consumption tax of 20 percent ad valorem and a four percent surcharge on the total amount of all customs charges are levied on all imports. The opening of most import letters of credit requires a peso deposit equivalent to the letter of credit value. No exacting health, product specification, labelling or packaging regulations apply to canned fish products.

Middle East

Saudi Arabia accounted for most canned small pelagic imports into the Middle East. Examination of Table 22, however, shows that considerable quantities of product was shipped in 1979 by Japan to the Yemen Arab Republic, Israel and the Peoples Democratic Republic of Yemen, as well as small quantities to other countries in the region. Import duties, regulations and requirements for some of these nations may be found in the FAO Register of Import Regulations for Fish and Fishery Products.

Saudi Arabia

Saudi Arabia accounted for the bulk of canned small pelagic imports into the Middle East in recent years. Annual receipts by this nation apparently increased about four-fold between 1974 and 1979. National exports and production of canned small pelagic products were nil during this period. Imports thus reflect consumption levels.

Annual import volumes are shown in Table 21. These data represent reported receipts of all canned fish and are thought to include at least small quantities of canned tuna and bonito products in the later years. However, the bulk of these imports, especially in the earlier years, was comprised of canned mackerel products. Until 1977 Japan apparently furnished nearly all Saudi Arabian imports, but in that year other suppliers - Denmark, Portugal, Morocco, Spain and probably others - began to report exports destined for Saudi Arabia. Japan, however, remained the principal supplier through 1979. Mackerel packed in oil, followed by tomato sauce-packed mackerel were the most popular products among Saudi consumers by 1979. This reversed the pattern of demand during the earlier years of the period when imports of tomato sauce-packed mackerel exceeded those of the oil pack. Canned sardine products appeared to be growing in popularity.

Data describing prices for these products in Saudi Arabia are not available. Examination of the reported values of Japanese shipments to Saudi Arabia reveal that Japanese prices to Saudi importers actually decreased (in terms of yen) substantially after 1974. This clearly may be one reason Saudi imports of canned mackerel products from Japan expanded markedly during the period. Whether consumers enjoyed these savings is unknown. The retail price for canned mackerel in Saudi Arabia was known to be US$ 3.00 per kilogram in January 1979 according to the only available sampling. Comparatively, the FOB value per kilogram of 1979 Japanese shipments of oil-packed mackerel was US$ 1.64, and US$ 0.75 for tomato sauce-pack mackerel.

The substantial yearly expansion of Saudi Arabian imports during the past six years points to opportunities for paricipation in this growth by emerging exporters if it continues, as it may very well do when the large national investments in improved transport infrastructure come on stream, opening up new market areas. Currently, poor transport facilities limit product distribution beyond metropolitan areas. It is quite likely, however, that market growth in the future will not match the rapid rate of recent years. The share of canned fish in the convenience food market will probably fall as a wider range and increased volume of convenience foods are put on the retail market.

Oceania

Imports into the three principal market countries in this region contracted after 1974, then recovered during 1978 and 1979 to stand at about the same level in the latter year as the first year of the period. Over seven percent of world trade volume in 1979 was destined for Papua New Guinea, Australia or Fiji. Papua New Guinea was by far the heaviest importer in the region. Year-to-year changes in the import volume of this nation accounted for most of the fluctuation in the regional total.

Australian imports of canned small pelagic products contracted about 30 percent between 1974 and 1979 as receipts of all product-types declined (Table 21). The market is dependent on imports for all its supplies; consequently imports reflect apparent consumption volume. Canned sardine products consistently accounted for the bulk of imports and consumption

during the period (55 percent in 1978-1979), 1/ with herring products representing most of the balance (23 percent in 1978-1979). The structure of import suppliers for each product-type remained intact during the entire period. Norway, the United Kingdom, Canada, Spain and Portufal furnished nearly all canned sardine supplies. Most canned herring products were supplied by the United Kingdom, the Federal Republic of Germany and Canada. Japan and the Republic of Korea consistently supplied the bulk of the diminishing canned mackerel receipts. Small canned anchovy imports were furnished by Sapin, Portugal and Italy. This market is expected to remain a stable but comparatively small outlet for canned small pelagic products in the future, with no significant changes in the current structure of demand.

Imports by Fiji were apparently quite stable in recent years, with canned mackerel packed in brine or water accounting for nearly all receipts. Small quantities of other canned mackerel products were also imported. Japan, however, supplied virtually all these imports under arrangements tied to the Japanese-Fijian joint-venture tuna canning operation in Fiji. A 50 percent duty is assessed on products from other sources.

Papua New Guinea

This nation imported large and expanding volumes of canned small pelagic products between 1974 and 1979, and represents the best prospect in the region for increased sales by exporters.

Table 38

Imports of canned small pelagic products - Papua New Guinea
(1000 m.t. reported weight)

	1973/ 1974 1/	1974/ 1975 1/	1975/ 1976 1/	1977 2/	1978 2/	1979 2/
Total	21.7	10.6	21.8	19.7	22.3	27.9
Sardine and herring	0.7	2.2	0.2	0.5	0.7	1.2
Mackerel	21.1	8.4	21.6	19.2	21.6	26.7

1/ Official data reported on Fiscal Year basis, i.e. July-June.
2/ Reported exports to Papua New Guinea by major exporters.

Import volume rose at least 27 percent in 1979 as compared to 1974, after dropping 50 percent during 1974/1975. Imports may be equated with apparent consumption as domestic production and exports were negligible. Canned mackerel, nearly all brine or water-packed product, accounted for most imports and consumption (an estimated 89 percent in 1979), but significant quantities of tomato sauce-packed mackerel were also represented. These two types of packs also accounted for most canned sardine consumption, but the order of importance was apparently reversed. Japan furnished virtually all canned mackerel supplies in earlier years (99 percent during 1975/1976, the last year for which an official break-down of receipts by origin were available), and still accounted for the great bulk of imports in latter years. Other exporters supplied small quantities of mackerel products during the

1/ See Table 21, footnote 8.

period, and shipments by Peru were known to have increased substantially beginning 1977. (Data describing Peruvian exports by destination were not available; import estimates shown in Table 38 for 1977-1979 thus undoubtedly represent under-estimates).

Imports and consumption of canned sardine products apparently increased after 1975/1976, but remained comparatively small. Available data indicate Japan, Norway and China were the leading suppliers, but here again the lack of data on Latin American exports by destination prevents a determination of the contribution of these countries to Papua New Guinea imports of canned sardine. Imports of herring products were small and apparently contracted during the period.

No duties are assessed on these products, but specific health, product specification, labelling and packaging standards are enforced. None of the institutional requirements mentioned above present serious obstacles to the inflow of foreign canned small pelagic products. Papua New Guinea is expected to remain a growing market for these products in the future.

South America

This region has represented a relatively small market for export supplies of canned small pelagic products. During 1978, only an estimated four percent of world trade volume in these products was destined for the two largest importing countries: Colombia and Bolivia. This was a result of the presence of several large producers in the region. Peru, Chile and Ecuador are all important exporters of canned small pelagic products. Brazil and Venezuela produced very significant volumes, primarily for their large domestic markets; imports are severely restricted.

Bolivia was one of the larger import markets in South America, but receipts (Table 21) were tightly controlled through tariffs, prior deposit requirements (25 percent of the C.I.F. value 120 days before expected date of arrival) and licensing (required from the Ministry of Agriculture and Livestock). This policy is aimed at protecting domestic food producers. No change in Government policy is foreseen, and Bolivian imports of canned small pelagic products are expected to be restricted to current levels.

Colombia

Colombia was the major import market for canned small pelagic products in South America. Import volumes, shown in Table 39, may be equated with apparent consumption, as exports were nil and domestic output was small and stable at about 500 tons annually.

Table 39

Imports of canned small pelagic products - Colombia
(1000 m.t. reported weight)

	1974	1975	1976	1977	1978	1979
Total	6.8	4.0	9.1	12.4	17.0	....
Sardine	....	....	2.0	1.7	....	....
Sardine-type	....	....	7.0	10.6	....	....
Anchovies	....	....	0.2	0	....	....

1/ Estimate based on the fact that the value of canned small pelagic imports in 1978 was 39 percent above that of 1977.

Imports and apparent consumption of canned small pelagic products increased more than four-fold between 1976 and 1978 after contracting slightly during 1975. Imports and consumption in recent years were concentrated on 'sardine-type' products, for the most part of canned 'pinchagua' (pacific thread herring) products from Ecuador. Peru was thought to be the principal supplier of the remaining volume of 'sardine-type products', which were probably canned mackerel. Canned sardine supplies appeared to be imported primarily from European and Scandinavian countries. Canned 'pinchagua' experienced tremendous growth in popularity, primarily as a function of its low cost, and it may be imported duty-free under an agreement with Ecuador. Requirements applicable to the import of canned small pelagic products into Colombia are summarized in Appendic C. Colombia should remain a lucrative market for low-priced products such as 'pinchagua' in the future. Participation in future growth, however, will be restricted to Andean Group countries - Ecuador, Peru and Venezuela - due to preferential tariff rates applying to products from these nations.

4. SUMMARY AND CONCLUSIONS

Small pelagic species are caught, canned and consumed world-wide. These species are represented in the fish populations of all the oceans and seas of the world, and are caught in at least small quantities by inhabitants of nearly all the world's coastal nations. Small pelagic species are commonly characterized by their abundance - total landings in 1979 - density of schools, their comparatively high fat content, and the very different properties (particularly oil and fat content) of individual fish between seasons.

Landings and utilization

Global landings of small pelagic species increased almost steadily after 1973, following the very sharp decline of the 1971-1973 years - the result of the collapse of the Peruvian anchoveta fishery - catches of pilchards, sardines, mackerels and horse and jack mackerels and scads. While a very signified proportion of world landings are reduced to fish meal and oil (about 44 percent of the total in 1979), the total volumes of fish devoted to this use each year have remained relatively stable in recent years. Conversely, the volumes utilized for canning and freezing (partly for raw material for the canning industry) expanded significantly during the same period, accounting for almost 27 percent of world landings in 1979. Pilchards, mackerels and herring account for the bulk of current canned production, and jack and horse mackerels and scads, sardines and anchovies are the principal species for canning purposes among the less important species groups.

Products

Small pelagic species are utilized in a wide variety of canned products, ranging from high-cost speciality items to low-cost products. Different products are necessarily produced for different markets and tastes according to the species used, the preparation of the fish prior to packing, the form or portions of the fish placed in the can, the ingredients included with the fish in the can, and the format (i.e. the size and shape of the can or air-tight container) used for presentation to the consumer. While of course products differ according to the species utilized, this aspect is further complicated by the fact that the same species may be used to produce very different products. However, canned small pelagic products may be grouped into four broad types, in order of importance in the world market :

1) Oil pack

2) Tomato sauce pack

3) Brine or water (natural) pack

4) Other speciality packs.

Production of Canned Products

World production of canned small pelagic products increased steadily after 1976, based primarily on the expanding output of canned mackerel (including horse and jack mackerel and scads). Sardine (pilchard production has also expanded in recent years after a sharp decline during 1976 and 1977, and this product group along with mackerel products accounted for fully 78 percent of canned small pelagic production in 1979. Production of canned products utilizing other species groups has remained quite stable in recent years

While many countries produce at least small volumes of canned small pelagic products, seven countries - Japan, Peru, France, Spain, Morrocco, the Federal Republic of Germany and Portugal - accounted for about two-thirds of the World output in 1979. The most significant development in the production picture in recent years was complete collapse of the large South-African and Namibian canning industry - through 1976 it was the second-largest in the world after that of Japan - and the continuing expansion of output in Asia and Latin America.

International Trade

An extremely diversified and truly international market has developed since World War II for canned small pelagic products, characterized by a wide variety of product-types and a very significant proportion of world output entering world trade channels (about 50 percent in 1979). This proportion is higher yet for canned sardine/pilchard and especially canned mackerel products. Despite the virtual withdrawal of the formely very important South Africa and Namibia from the export market, the volume of world trade in canned small pelagic products has trended upward in recent years, dominated by canned sardine/pilchard and mackerel products - these species accounted for almost 90 percent of export supplies of canned small pelagic products in 1979. Five countries - Japan (by far the most important), Morrocco, Spain, Portugal and Peru furnished almost 80 percent of world export supplies of canned small pelagic products in 1979, Peru being the recent, dynamic entry in the large exporter league. The import demand side of the market contrasts sharply with the supply side. Most nations of the world are represented as importers of at least small volumes of these products, and each exhibits different preferences among the many product-types available. This makes for a world market picture of some complexity. Conclusions as to those national markets presenting the best prospects for increased sales by exporters in developing countries of canned small pelagic products - the export supply of which is expected to grow in the future - are summarized below.

The Promising Import Markets

Europe and Scandinavia remained the largest regional market for these products through 1979, despite an apparent drop in total consumption in recent years. Nevertheless, selected national markets appear to offer good prospects for heavier export sales.

In the United Kingdom, a market still adjusting ot the disappearance of the favoured South African and Namibian product is thought to offer bright prospects for increased export sales of canned pilchard products, and to a lesser extent, canned mackerel. In France, more limited opportunities for heavier export sales appear to exist for canned pilchard and anchovy, but exacting consumer requirements must be faced. In the Federal Republic of Germany some increase in export sales of canned mackerel products appears possible, but the market for these products is very price-sensitive. Similarly, the Italian market for canned mackerel products may offer expanded sales opportunities, but the strong preference for atlantic mackerel products is a limiting factor.

Imports of canned small pelagics into the African Continent expanded sharply then apparently declined moderately in recent years, but Nigeria and Egypt are expected to remain very sizable outlets for canned small pelagics. In Nigeria, demand for both canned mackerel and sardine products is expected to remain at very high levels. National demand for these products is lower in Egypt and more concentrated in mackerel products. But given recent government policy with respect to fish imports, demand for both canned mackerel and sardine products is expected to increase over recent levels.

In Asia, both Malaysia and Sri Lanka present rapidly expanding markets for imported canned mackerel products, and the prospects appear bright for further growth. Export sales of canned sardine products in both countries are also increasing but at a slower pace than those of mackerel.

In the North America and Carribean region, the United States and Jamaica are thought to offer the best opportunities for increased sales of canned sardine and mackerel products by developing exporters. Opportunities in the United States will be dependent on developments in domestic production, and in supplies from traditional foreign suppliers such as Norway. In Jamaica, government policy towards imports and foreign exchange availability will be determining factors.

The Middle East represents a growing market, highlighted by Saudi Arabia, where demand for canned mackerel products is expected to continue.

In Oceania, demand should continue in Papua New Guinea for canned mackerel products. Imports have increased rapidly in recent years with no sigh of abating.

Appendix Table A-1

Annual landings of small pelagic species, total and by species

(1000 metric tons, live weight)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979* 5/
Total	28809	27757	21409	20199	22944	22967	25470	24754	26333	27170
Herrings	2992	2798	2696	2844	2296	2352	1943	1901	1827	1771
Atlantic herring	2322	2144	1909	1980	1565	1527	1178	990	940	848
Pacific herring	582	516	621	661	520	538	431	412	188	175*
Red-eye round herring	36*	75*	78*	76*	56*	85*	80*	86*	125*	78*
Pacific thread herring	42	48	70	116	147	195	242	406	570	666*
Atlantic thread herring	10	15	19	11	8	6	13	6	4	4*
Sprats	241	307	456	651	838	1060	942	657	714	681
Sprat	241	307	334	517	655	993	914	644	687	662
Chilean sprat	...	...	121	134	183	67	28	13	27	19
Sardines	1389	1328	1326	1108	1067	1332	1195	1793	1917	1707
Indian oil-sardine	336	318	238	181	254	383	406	407	440	353*
Round sardinella	42	53	55	48	24	110	94	122	126	119*
Sardinellas n.e.i. 1/	984*	930*	1007*	839*	738*	776*	639*	1199*	1275*	1158*
Fringescale sardinella	27	27	26	40	51	63	56	65	76	77
Pilchards	1211	1204	1354	1995	2322	2612	3678	4524	4848	5793
Japanese pilchard	17	58	58	301	352	530	1077	1471	1934	2053
Californian pilchard	36	51	54	65	84	122	142	123	156	186
Chilean pilchard	69	181	17	186	281	228	502	1492	1807	2693*
South african pilchard	607	393	551	495	618	662	640	326	150	96*
European pilchard	482*	521*	675*	949*	987	1070*	1316	1113*	801*	765*
Menhadens	992	1172	909	975	997	887	987	891	1256	1259
Atlantic menhaden	285	266	378	369	320	275	364	367	357	374*
Gulf menhaden	549	730	502	487	588	543	562	447	820	807
S.E. pacific menhaden	20	23	39	47	18	4	3	6	4	4*
Bonga	136	150	55	60	63*	59*	56*	66*	69*	69*
S.W. pacific menhaden	2	3	6	11	8	6	2	4	5	5*
Anchoveta (peruvian anchovy)	13060	11238	4815	1705	3973	3319	4297	811	1386	1207*

Appendix Table A-1 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Anchovies	1475	1464	1590	1903	2256	1946	1883	2041	2121	2123
European anchovy	329	335	356*	382*	600	459	508	418*	400*	423*
Japanese anchovy	420	418	474	431	461	421	343	386	336	315*
Anchoita	14	21	41	34	30	19	20	22	16	16*
N. Pacific anchovy	93	45	74	128	123	209	199	284	196	303
Cape anchovy	404	395	372	558	596	409	306	368	564	570
C. Pacific anchoveta	29	52	35	60	16	45	121	170	79*	20*
Anchovies n.e.i. 2/	96	110	109	159	276	231	234	244*	328	265*
'Stolephorus' anchovies	90*	88*	129	150	155	152	152	149	202	211
Other Clupeoids 3/	223*	229*	289*	312*	320*	269*	278*	265*	246*	232*
Mackerels	3235	3167	3116	3358	3530	3564	3275	3548	4141	3961
Narrow-barred king mackerel	32	32	45*	46*	53	52	50	54	49	54*
Indo-pacific king mackerel	6	7	9*	9*	13	12*	20*	18*	15	15*
King mackerel	2	3	3	4	4	4	3	3	3	4*
Atlantic spanish mackerel	14	13	14	16	15	15	16	15	13	13*
Cero	-	-	0	0	0	0	0	0	0	0
Sierra	3	4	6	4	5	7	5	5	4*	5*
W. african spanish mackerel	-	1	2	1	4	1	1	1	1	2
Japanese spanish mackerel	55	14	51	52	61	53	54	73	63	65*
King mackerels n.e.i.	50	59	48	43	61	60	55	57	59	60*
Chub mackerel	1995*	1797*	1835*	1844*	2044*	1960*	1703*	2312*	2846*	2604*
Atlantic mackerel	681	763	788	1028*	990	1097*	1077	688*	712	776*
Indian mackerel	156	223	166*	126*	99	96	111	148	173	168
Short-mackerel	... 4/	... 4/	25	29	35	29	31	22	25	18
Indian mackerels n.e.i.	241	251	124	156	146	178	149	152	178	177*
Horse & Jack Mackerels & Scads	1692	2161	1884	2166	2169	2239	2663	3214	3274	3475
Atlantic horse mackerel	256	245	265	356	285	282	382	224	147	163*
Offshore jack mackerel	1	-	0	0	2	1	1	2	2	2*
Japanese jack mackerel	222	283	157	131	169	193	136	95	64	68*
Chilean jack mackerel	117	168	110	161	323	299	396	848	1101	1600*
Pacific jack mackerel	22	27	23	9	12	20	21	50	32	17
Mediterranean horse mackerel	4	5	28	30	17	18	24	21*	22*	22*

Appendix Table A-1 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Horse & Jack Mackerels & Scad (cont.)										
Rough scad	-	-	0	1	0	0	-	-	-	-
Cape horse mackerel	62	239	84	280	196	316	548	688	552	441*
Cunene horse mackerel	168	143	271	175	130	108	31	34	378	272*
Jack & horse mackerels n.e.i.	344	557	551*	579*	574	544	548	631*	435	356*
Round scad	54	45	42	55	50	50	79	98	95	95*
Russell's scad	10	12	15	30	55	42	100	153	131	106
Scads	373	367	264	274	282	286	308	263	225	241
Hardtail scad	12	12	10	12	18	16	33	40	35	36
Bigeye scad	47	58	64	74	56	64	55	66	55	56*
Sauries	164	266	285	493	220	317	188	343	462	449*
Pacific saury	163	264	282	491	218	317	188	343	462	449*
Atlantic saury	2	3*	4	3	2	1	-	-	0	0*
Capelin	1515	1584	1946	2054	1907	2248	3359	4009	3157	2934*
Polar Cod	268	348	167	82	125	63	12	8	5	0
Norway Pout	309	400	525	503	878	694	644	498	425	440*
Blue Whiting	43	91	51*	50*	46	65	126	251	554*	1138*

1/ Includes scaled sardines and sardinellas n.e.i.
2/ Includes atlantic anchoveta and anchovies n.e.i.
3/ Includes spotted herring, rainbow sardine, lady fish, tarpon, indo-pacific tarpon, and clupeoids n.e.i.
4/ Included with Indian mackerel n.e.i.
5/ Landings for many species and totals in 1979 must be considered estimates. Data for several key producers - Japan, China, India, Peru, Ecuador, Argentina, Colombia, Spain, the Federal Republic of Germany, Finland, Senegal and Ivory Coast - were not available at printing. For these countries, landings in 1978 are included as estimates for 1979.

Appendix Table A-2

Small pelagic landings by country and major species
(In 1000 metric tons)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Africa										
Algeria, total	20	19	23	24	28	29	27	35	25	28
European pilchard	17	16	19	16	20	26	21	28	20	21
European anchovy	2	1	1	6	4	1	3	4	3	3
Horse & jack mackerels n.e.i.	2	2	2	2	2	2	2	2	1	2
Angola, total	307	248	507	386	315	133	53	82	90	83
Cunene horse mackerel	166	137	271	175	127	108	30	34	42	57
Sardinellas n.e.i	67	86	142	116	50	21	20	48	46	22
South african pilchard	51	2	73	23	34	3	1	-	-	-
Anchovies n.e.i.	0	4	13	65	103	6	2	0	2	3
Congo, total	3	2	7	7	6	5	6	5	5	7
Egypt, total	2	7	8	3	5	3	3	2	2	...
Ghana, total	74	133	133	86	94	105	107	109	132	83
Sardinellas n.e.i.	27	50	93	22	23	31	46	43	72	39
Anchovies n.e.i.	26	41	27	15	33	32	29	35	51	37
Chub mackerel	12	15	19	11	1	3	1	0	1	0
Horse & jack mackerels	-	16	25	33	21	35	31	21	2	3
Ivory Coast, total	32	45	48	33	36	33	36	34	30	...
Sardinellas, n.e.i.	26	25	31	19	22	19	22	20	16	...
Bonga	3	14	14	14	14	14	14	14	14	...
Morocco, total	206	200	197	370	250	206	266	225	261	250
European pilchard	163	133	135	349	224	167	225	130	148	200
Jack & horse mackerels n.e.i.	7	5	6	7	7	24	19	44	58	24
Chub mackerel	31	10	5	9	16	12	16	40	46	15
European anchovy	6	2	2	5	2	2	6	10	9	11

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Namibia, total	...	587	525	707	837	759	573	402	414	324
South african pilchard	...	259	364	396	557	545	447	194	45	28
Cape anchovy	...	244	145	302	255	194	94	125	360	259
Cape horse mackerel	...	83	16	7	25	9	20	83	9	25
Nigeria, total	...	...	...	8	8	9	6	7	7	7
Senegal, total	60	69	111	114	136	123	133	135	128	...
Sardinellas n.e.i.	41	44	81	81	100	97	106	102	91	...
Bonga	15	20	24	24	26	21	19	25	24	...
Sierra Leone, total	25	25	30	38	38	39	40	30	27	30
South Africa, total	1406 1/	419	431	424	407	424	419	382	389	431
Cape anchovy	404	150	228	245	342	215	211	244	204	310
South african pilchard	556	131	114	79	15	104	183	65	99	63
Chub mackerel	78	55	57	59	31	69	1	21	2	11
Red-eye round herring	3	16	20	26	1	21	8	35	67	97
Tunisia, total	8	10	11	11	17	12	13	13	16	17
European pilchard	3	4	5	6	5	7	8	9	11	11
North America										
Canada, total	502	447	364	310	302	323	333	357	372	239
Atlantic herring	479	419	304	225	225	245	226	229	246	144
Capelin	3	3	5	7	16	5	10	11	19	22
Pacific herring	4	10	39	56	45	60	81	97	81	43
Atlantic mackerel	16	15	16	22	17	14	16	20	25	29
Cuba, total	12	8	10	13	3	16	20	26	56	38
Cape horse mackerel	2	5	7	10	-	11	8	15	50	31
Mexico, total	49	64	72	80	139	196	235	317	361	460
Californian pilchard	35	51	53	65	84	122	142	123	156	186
N. pacific anchovy	5	4	6	2	42	60	79	179	180	250
Chub mackerel	0	1	0	0	0	2	2	4	14	9
Panama, total	36	57	49	77	52	64	135	139	95	132
Pacific thread herring	7	6	14	21	37	20	17	23	20	116
Central pacific anchoveta	29	52	35	57	15	44	119	165	75	16

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
U.S.A., total	1012	1133	1059	1068	1089	1070	1173	1073	1325	1392
Gulf menhaden	549	730	502	487	588	543	562	448	820	807
Atlantic menhaden	285	266	378	369	320	276	364	367	357	374
N. pacific anchovy	88	41	63	126	80	149	120	105	16	53
Atlantic herring	30	35	40	26	33	36	50	51	50	65
Pacific herring	10	6	9	20	26	23	20	20	20	30
Chub mackerel	0	0	0	0	0	0	0	5	11	27
Pacific jack mackerel	22	27	23	9	12	17	20	50	31	16
Atlantic mackerel	4	2	3	2	1	2	3	1	2	2
South America										
Argentina, total	25	35	48	47	41	29	23	26	19	...
Anchoita	14	21	41	34	30	19	20	22	16	...
Chub mackerel	10	14	6	12	3	9	0	1	0	...
Brazil, total	107	147	173	194	213	160	115	193	228	242
Sardinellas n.e.i.	96	132	159	172	192	139	97	165	196	211
Chub mackerel	3	2	3	5	1	1	4	6	7	7
Anchovies n.e.i.	3	6	6	1	5	8	10	14	17	18
Chile, total	964	1294	587	503	975	749	1185	1135	1759	2376
Chilean jack mackerel	112	158	87	118	193	261	342	341	587	598
Chilean pilchard	68	175	132	54	208	165	327	621	733	1619
Anchoveta	783	961	363	192	389	240	434	19	229	51
Chub mackerel	...	...	...	4	0	15	53	141	183	89
Chilean sprat	...	...	121	134	183	67	28	13	27	19
Colombia, total	2	3	2	5	3	4	6	5	...	...
Central pacific anchoveta	0	1	0	3	1	2	3	5	...	...
Ecuador, total (all pacific thread herring)	35	42	55	95	110	175	225	383	550	...
Peru, total	12311	10326	4521	1799	3867	3209	4136	2221	2795	
Anchoveta	12277	10277	4447	1513	3583	3079	3863	792	1157	
Chilean pilchard	1	6	6	132	73	63	175	871	1075	
Chilean jack mackerel	5	9	19	43	129	38	54	505	463	
Chub mackerel	9	10	9	65	63	24	40	46	97	

Appendix Table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Venezuela, total	56	64	64	66	38	59	52	47	39	...
Round sardinella	41	44	45	48	23	48	37	36	28	...
Atlantic thread herring	7	9	9	9	5	2	4	2	1	...
Atlantic anchoveta	4	3	2	2	2	1	5	2	4	...
Asia										
China 2/	301	162	388	325	284	242	234	257	390	...
Chub mackerel	202	60	97	101	117	89	83	143	287	...
Japanese spanish mackerel	30	4 4/	38	41	47	44	44	52	45	...
Pacific herrings 3/	2	31	182	121	72	58	55	18	22	...
Rainbow sardine 4/	9	12	9	6	8	10	8	4	5	...
Horse & jack mackerels n.e.i. 4/	14	14	14	10	10	11	12	15	14	...
Bigeye scad 5/	14	15	19	25	9	9	10	7	6	...
Anchovies n.e.i. 4/	10	10	10	10	12	12	13	7	3	...
Sardinellas n.e.i. 4/	20	16	19	10	9	9	9	11	8	...
India, total	499	548	369	294	409	403	423	416	441	...
Indian oil-sardine	226	209	125	73	138	246	261	232	238	...
Clupeoids n.e.i.	82	85	71	96	112	36	26	18	16	...
Indian mackerel	139	205	121	70	41	41	47	76	90	...
Anchovies n.e.i.	38	30	30	38	95	59	64	70	73	...
Indonesia, total	...	221	237	264	304	348	346	390	420	445
Scads	...	33	54	54	56	69	73	68	69	78
Indian oil-sardine	...	18	18	13	16	42	41	63	50	58
Fringescale sardinella	...	27	26	40	51	63	56	65	76	77
'Stolephorus' anchovies	...	46	40	64	76	67	69	81	105	102
Indian mackerels n.e.i.	...	65	62	56	65	71	62	71	79	85
Japan, total	2229	2453	2213	2587	2532	2778	2810	3637	4077	...
Japanese pilchard	17	57	58	297	352	526	1066	1421	1637	...
Chub mackerel	1302	1253	1188	1134	1331	1318	979	1355	1623	...
Japanese anchovy	366	351	370	335	288	245	217	245	153	...
Japanese jack mackerel	216	271	152	128	166	187	128	88	59	...
Pacific saury	93	190	187	406	135	222	105	253	363	...

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Republic of Korea, total	124	181	241	221	299	290	302	360	386	370
Japanese pilchard	0	0	0	4	0	4	11	50	54	47
Japanese anchovy	54	67	104	96	173	175	126	141	183	162
Chub mackerel	38	61	79	74	81	70	107	113	100	120
Pacific saury	25	31	39	34	32	26	42	23	22	17
Peninsular Malaysia, total	81	93	71	89	89	73	83	93	111	142
Indian mackerels n.e.i.	35	39	17	30	25	21	19	29	40	54
'Stolephorus' anchovies	...	24	19	24	13	13	15	16	19	37
Russel's scad	6	7	12	14	20	16	16	21	24	20
Hardtail scad	...	7	5	5	9	5	7	5	10	12
Pakistan, total	3	1	3	5	4	4	6	14	71	33
Indian oil-sardine	3	1	3	5	4	4	6	14	71	33
Philippines, total	494	532	501	534	531	543	519	550	543	472
Scads	321	317	189	212	213	206	225	183	142	146
Sardinellas n.e.i.	...	101	101	104	84	92	62	128	150	106
Rainbow sardine	...	...	41	44	46	52	44	61	36	24
'Stolephorus' anchovies	20	17	68	60	62	69	66	50	76	70
Short-mackerel	...	...	25	29	35	29	31	22	25	18
Indian mackerel	45	44	23	27	33	26	32	32	38	39
Narrow-barred king mackerel	8	11	8	9	10	13	11	16	12	15
Sri Lanka, total	25	22	23	24	29	36	43	50	58	64
Thailand, total	166	177	96	166	192	219	271	460	360	289
Russel's scad	...	4	3	16	35	26	84	131	107	86
Sardinellas n.e.i.	...	29	11	34	58	64	67	214	145	116
Indian mackerel	...	15	14	24	20	23	26	33	37	30
Indian mackerels	166	101	42	56	41	69	54	31	45	36
Hardtail scad	...	4	2	4	5	6	15	26	15	12
Turkey, total	66	85	143	120	204	147	102	...	...	...
European anchovy	56	70	112	90	188	130	80	...	...	...
Yemen, Dem.	93	92	93	112	110	107	112	114	94	26
Indian oil-sardine	90	89	91	91	96	91	97	99	81	24
Indian mackerels	0	2	2	11	13	16	14	16	13	2

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Europe										
Norway, total	2101	2205	2274	2159	1777	1759	2580	2563	1770	1825
Capelin	1301	1371	1556	1332	1030	980	1972	2137	1281	1232
Atlantic herring	285	237	156	146	76	40	37	20	20	10
Sprat	14	9	19	17	20	162	114	34	102	89
Atlantic mackerel	279	203	160	338	288	243	212	182	93	126
Norway pout	116	143	179	172	259	309	215	148	156	143
Blue whiting	...	-	1	2	3	8	26	40	118	221
Sardinellas n.e.i.	69	63	135	53	21	4	-	-	-	-
Iceland, total	248	248	320	497	522	550	517	875	1065	1042
Capelin	192	183	277	442	462	501	459	813	967	964
Atlantic herring	51	61	42	43	40	33	30	29	37	45
Norway pout	3	3	0	9	14	4	27	24	35	14
Blue whiting	-	-	1	0	0	0	1	10	26	19
Spain, total	344	329	317	376	356	389	466	448	420	...
Atlantic horse mackerel	98	...	80	113	71	84	112	102	76	...
European pilchard	120	...	128	151	160	168	216	189	203	...
European anchovy	56	...	29	45	47	52	71	82	76	...
Atlantic mackerel	41	...	37	31	37	31	21	28	28	...
Blue whiting	15	...	26	24	23	26	22	23	22	...
Poland, total	234	307	320	336	373	453	429	414	290	245
Atlantic herring	128	136	101	115	113	118	85	60	64	79
European pilchard	-	2	2	16	24	77	107	136	3	-
Sprat	20	32	39	50	62	72	67	51	29	14
Atlantic mackerel	75	123	156	128	123	98	75	20	0	0
South african pilchard	-	-	-	0	10	9	2	12	3	3
Sardinellas n.e.i.	-	-	2	1	0	1	1	40	41	50
Denmark, total	450	588	657	756	883	918	792	674	654	793
Atlantic herring	254	332	358	383	177	217	107	94	67	64
Sprat	9	34	20	127	227	424	363	260	289	361
Norway pout	158	205	277	238	475	267	285	261	190	252
Blue whiting	-	-	-	-	-	-	8	35	78	82
Atlantic mackerel	29	18	2	8	4	10	28	23	27	29

Appendix table A-2 (cont.)

	1970	1871	1972	1973	1974	1975	1976	1977	1978	1979
United Kingdom, total	198	218	239	313	315	267	310	361	472	418
Atlantic herring	155	157	161	167	160	124	99	52	23	12
European pilchard	1	1	2	2	1	2	4	11	10	10
Sprat	36	51	62	97	83	59	90	97	102	32
Norway pout	0	2	5	24	38	33	26	7	6	3
Atlantic mackerel	5	7	9	21	30	48	87	188	321	353
Portugal, total	173	164	171	170	142	152	143	152	130	133
Atlantic horse mackerel	63	57	63	45	51	46	51	54	35	31
European pilchard	69	85	88	101	75	96	80	80	84	91
Chub mackerel	39	20	18	22	11	7	9	12	9	8
Sweden, total	183	137	139	154	142	142	127	133	141	150
Atlantic herring	174	128	120	124	115	101	93	105	115	125
Sprat	6	6	7	24	21	31	22	14	14	19
German Dem. Rep., total	122	189	210	223	189	190	144	121	107	147
Atlantic herring	80	65	109	129	109	107	70	62	46	50
European pilchard	2	3	2	3	3	6	10	13	0	3
Sprat	8	16	14	13	14	17	14	19	14	4
Atlantic mackerel	7	69	31	79	63	58	43	8	0	0
Blue whiting	0	0	-	-	-	-	5	3	10	23
Italy, total	118	114	118	123	140	115	110	102	125	153
European pilchard	44	43	42	42	53	44	42	42	54	52
European anchovy	53	53	60	63	70	51	52	42	54	87
Atlantic mackerel	12	6	5	6	5	4	4	5	6	4
Bulgaria, total	39	52	47	60	65	123	99	101	74	51
European pilchard	-	-	1	2	5	20	14	30	22	-
Cape horse mackerel	2	6	3	2	3	20	10	31	26	18
Atlantic mackerel	4	29	24	36	34	40	41	3	0	1
Sprat	1	3	3	3	5	6	7	9	11	14
Finland, total	53	61	57	71	75	73	81	81	92	...
Atlantic herring	52	60	56	69	74	71	77	78	89	...

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Faeroe Islands, total	109	117	125	152	162	188	222	175	183	131
Atlantic herring	75	67	61	76	39	38	22	21	1	1
Atlantic mackerel	2	4	8	12	27	25	69	47	46	39
Norway pout	32	47	57	54	87	65	71	51	37	27
Blue whiting	0	0	0	5	4	0	14	30	44	38
Capelin	-	-	-	-	-	17	-	25	55	24
Romania, total	11	20	35	50	74	80	70	85	83	119
European pilchard	-	-	-	0	21	35	18	27	11	1
Horse & jack mackerels n.e.i.	5	5	14	29	35	26	14	39	34	41
Atlantic mackerel	2	5	3	6	7	2	18	1	0	0
France, total	128	118	117	118	105	102	89	79	81	85
Atlantic herring	24	24	30	34	25	30	22	4	4	4
European pilchard	41	40	31	27	24	29	18	21	20	25
Atlantic mackerel	50	44	43	42	41	30	37	39	41	39
European anchovy	6	7	8	6	8	6	4	5	6	4
Netherlands, total	67	64	68	84	72	92	77	65	78	103
Atlantic herring	58	53	56	73	59	71	57	20	8	3
Atlantic mackerel	7	9	11	10	11	16	17	38	52	63
Atlantic horse mackerel	0	0	0	0	1	0	0	2	11	32
Ireland, total	49	40	59	55	55	47	47	55	73	55
Atlantic herring	43	31	48	39	40	30	22	23	28	27
Atlantic mackerel	1	3	5	8	9	13	14	23	33	25
Germany, Fed. Rep., total	180	95	57	89	85	59	29	40	73	...
Atlantic herring	169	86	54	71	59	52	23	8	8	...
Sprat	8	5	2	12	19	2	4	12	5	...
Atlantic mackerel	2	4	1	3	2	3	2	6	29	...
Blue whiting	-	-	-	-	3	0	0	10	16	...
Yugoslavia, total	20	24	24	24	23	25	27	27	30	27
European pilchard	11	15	18	19	16	19	22	23	22	19
European anchovy	3	3	2	2	2	3	3	2	3	2
Sprat	6	4	3	3	4	2	2	2	4	5

Appendix table A-2 (cont.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
U.S.S.R., total	2129	2303	2317	2857	3114	3602	4104	3753	3652	3995
Capelin	15	25	106	267	379	709	895	998	813	685
Chub mackerel	171	196	303	323	365	315	376	390	445	287
Cunene horse mackerel	-	-	-	-	-	-	-	-	337	216
Cape horse mackerel	41	59	19	207	115	179	410	436	272	151
Horse & jack mackerels n.e.i.	236	334	357	348	365	349	354	399	211	143
Japanese pilchard	-	-	-	-	-	-	-	-	243	369
Sardinellas n.e.i.	124 6/	164 6/	136 6/	0	1	-	0	37	194	180
Round sardinella	-	9	10	0	0	59	55	85	97	36
Pacific herring	468	311	326	380	305	323	209	253	58	73
Atlantic herring	262	244	212	252	212	205	156	134	133	119
Chilean jack mackerel	-	-	6	-	-	-	-	-	49	532
Atlantic horse mackerel	75	57	108	154	120	122	189	51	1	0
Atlantic mackerel	143	176	218	267	277	450	370	49	1	1
European anchovy	137	147	129	154	265	202	275	177	157	147
Sprat	121	136	153	155	134	165	167	131	98	104
European pilchard	-	-	4	205	344	361	517	359	177	112
Blue whiting	22	64	13	8	2	18	27	71	211	689
Polar cod	259	332	166	79	125	63	12	8	5	0
Pacific saury	45	43	47	50	51	69	40	67	78	69

1/ Includes landings in Namibia.
2/ Includes Taiwan Province.
3/ Landings in Taiwan Province unknown.
4/ Landings in Taiwan Province only; landings in the rest of China are unknown
5/ Landings in Taiwan Province; landings of this and other scad species in the rest of China are unknown.
6/ Mostly european pilchard.

Appendix Table A-3

Total production of canned small pelagics - by regions and selected countries
(1000 metric tons, net product weight)

	1972	1973	1974	1975	1976	1977	1978	1979
Total	856.3	923.6	947.7	991.6	911.1	921.4	955.9	993.4
Europe and Scandinavia	316.4	329.9	319.6	309.5	304.1	308.6	330.0	319.9
Germany, Fed. Rep.	43.7	44.4	53.5	53.6	57.5	53.2	50.6	46.3
France	64.9	65.9	64.8	65.0	59.1	63.0	70.2	71.6
Spain	65.6	68.8	72.8	71.0	66.4	60.0	69.9	
Portugal	39.7	44.5	28.0	33.3	27.6	37.0	39.5*	35.2
Denmark	19.5	21.3	16.3	19.1	21.9	22.2	24.8	
Norway	32.4	34.4	29.0	15.5	19.1	20.3	21.7	21.7*
Sweden	16.1	18.2	18.8	17.4	17.9	18.5	17.7*	
Italy	7.0	7.8	8.1	7.6	8.5	9.0	10.1	11.8
Poland	11.0	9.8	11.3	12.0	11.6	11.3	12.2	7.0
United Kingdom	8.8	7.3	10.7	8.7	7.7			
Netherlands	5.8	5.2	4.9	5.2	5.4	4.7	4.1	4.2
Iceland	0.6	1.2	0.8	0.6	0.8	1.3	1.3	1.8
Belgium	1.3	1.1	0.6	0.5	0.6	0.4	0.2	
North and Central America	59.5	45.8	52.7	63.5	53.6	63.2	70.3	76.0
Mexico	21.7	21.3	23.4	34.6	26.4	22.4	25.9	33.8
United States	23.3	12.8	15.7	18.1	17.4	29.9	28.8	27.3
Canada	14.5	11.7	13.6	10.8	9.8	10.9	14.4	
Costa Rica	....	....	....	....	....	....	1.2	1.1
South America	120.3	140.3	133.3	185.1	129.6	146.4	164.4	206.8
Peru	23.1*	27.1*	29.2*	23.2	28.6	45.0	59.0	78.6
Brazil	34.7	56.2	48.9	91.2	37.0	39.4	35.2*	
Venezuela	35.8	27.4	21.0	38.7	28.4	16.8	13.0*	30.0*
Ecuador	6.3	9.8	9.9	9.1	13.9	25.2		
Chile	8.6	7.5	11.2	7.0	12.2	10.9	18.5	24.3
Argentina	11.8	12.3	13.1	15.9	9.5	9.1*	13.5	
Africa	120.7	176.8	201.6	189.2	177.1	94.2	53.3	62.5
Morocco 1/	45.6	65.4	58.2	39.5	52.5	42.7	36.6	47.0
South Africa and Namibia	72.2	109.6	140.5	147.2	121.9	49.1	15.0	13.1
Algeria	2.9	1.8	2.9	2.5	2.7	2.4	1.7	2.4

Appendix Table A-3 (Cont.)

	1972	1973	1974	1975	1976	1977	1978	1979
Asia	239.4	230.8	240.5	244.3	246.7	309.0	337.9	327.4
Japan	232.4	224.5	226.3	235.8	230.1	273.6	288.9	271.1
Republic of Korea	3.1	3.9	11.6	5.1	11.7	6.6	12.2	7.9
Philippines	0	0.1	0.3	0.4	1.2	18.7	22.0	34.0*
China 2/	1.6	0.8	0.5	....	....	1.8	1.5	1.5*
Penn. Malaysia 1/	....	0	0.2	0.3	0.6	2.4	2.9	2.9*
Thailand 1/	....	....	0.1	1.3	1.9	4.8	9.8	10.0*
Israel	2.3	1.5	1.5	1.4	1.2	1.1	0.6	10.0*

1/ Export data
2/ Taiwan Province

A P P E N D I X B

Small Pelagic Landings - Developments in the Past Decade and Production Potentials in Each Major Fishing Area

Recent production and future potential, by fishing area

Global landings of small pelagic species are examined in broad terms by species and fishing area in section 2.A of this report. In section 2.B landings of key species in important canning countries are discussed in conjunction with trends in canned small pelagic output. Appendix Tables A-1 and A-2 may be consulted for data describing small pelagic landings by species and country.

Southeast Pacific

The most striking change in the small pelagics production picture in the past decade was the precipitous decline of catches in the southeast Pacific. Where this ocean area produced 13.3 million tons in 1970, accounting for fully 46 percent of world-wide small pelagic production in that year, total landings dropped to 2.3 million tons in 1973. The following years witnessed some recovery, however, as catches increased to 5.7 million tons in 1979, 21 percent of world-wide small pelagic landings. Of course, the reason for this dramatic change in fortunes lay in the collapse of the anchoveta fishery off Peru and Chile. Landings of this species by Peru made up the great bulk of area production until 1977, when chilean pilchard assumed the position of volume leader. These two species together with chilean jack mackerel, chub mackerel and chilean sprat accounted for nearly all are landings. However, it should be pointed out that a very high proportion of catches in this area are used for fishmeal.

As may be seen below, Peru and Chile accounted for all catches in the area until 1977, when Japan commenced exploitation of the southeast Pacific. In 1978, the Republic of Korea and the U.S.S.R. began operations in the area with the latter making notable catches of chilean jack mackerel.

Appendix Table B-1

Small pelagic catches in the Southeast Pacific
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	13275	11620	5113	2302	4842	3957	5321	3358	4607	5717
Contiguous Countries	13275	11620	5113	2302	4842	3957	5321	3356	4554	
Peru					3867	3209	4136	2221	2795	
Chile					975	749	1185	1135	1759	2376
Non-contiguous Countries								2	53	
U.S.S.R.					-	-	-	-	51	
Japan					-	-	-	2	2	
Korea, Rep.					-	-	-	-	1	

Available estimates of production potential, as well as the levels of 1978 landings, are summarized below.

Appendix Table B-2

Recent production and future potential - Southeast Pacific
(1000 m.t.)

	Landings (1978)	Est. potential
All pelagic species	4607	not avail.
Anchoveta	1386	9 - 12000 1/
Peru	1157	9 - 11000
Chile	229	1000 2/
Chilean pilchard (sardine)	1801	> 900?
Peru	1075	900 3/
Chile	733	not avail.
Chilean jack mackerel	1101	> 1000?
Peru	463	1000 3/
Chile	587	not avail.
Non-contiguous countries	52	—
Chub mackerel	282	> 350?
Peru	97	350 3/
Chile	183	not avail.

1/ Gulland, J.A., Review of the state of world fishery resources. FAO, FIRM/C710, 1978.
2/ Under conditions as in the 1960s.
3/ Instituto del Mar del Peru recommendations for maximum catch levels in Peruvian waters in 1978.

As may be seen above, there remains considerable scope for expansion of small pelagic production in the southeast Pacific.

Northwest Atlantic

This is another area where catches declined substantially, especially during 1977-1979. Contributing five percent to world-wide small pelagic production in 1970, the northwest Atlantic's share in the total dropped to two percent in 1979. Capelin, atlantic herring, atlantic mackerel and atlantic menhaden accounted for nearly all landings, but annual production levels of all these species except atlantic menhaden dropped considerably during the past ten years. Catches of atlantic mackerel and capelin fell very sharply during 1977-1979; these declines were related to the constraints placed on foreign distant-water fleets beginning in 1977 with the claiming of a 200-mile EEZ by both the United States and Canada in that year. Additionally, reduced catches were symptomatic of the diminishing stocks of atlantic mackerel and atlantic herring and the consequent restrictions placed on their exploitation to conserve these stocks.

Appendix table B-3

Small pelagic catches in the Northwest Atlantic
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	1318	1346	1375	1517	1329	1305	1226	881	685	563
Contiguous Countries					555	504	605	606	609	
United States					297	240	354	347	320	
Canada					258	264	251	260	289	
Non-contiguous Countries					760	799	615	271	72	
U.S.S.R.					414	465	419	195	64	
Norway					43	37	23	22	4	
Poland					145	138	77	23	2	
Cuba					-	2	7	7	1	
Iceland					-	16	9	3	0	
German Dem. Rep.					93	79	46	9	0	
Spain					4	4	0	0	0	
Germany, Fed. Rep.					28	26	11	0	-	
Bulgaria					23	21	15	7	-	
Japan					4	5	6	5	-	
Portugal					4	1	-	-	-	
France					4	5	1	-	-	

Northeast Atlantic

Catches in this crucial area expanded steadily through 1976, then declined moderately in 1977 and 1978 before recovering during 1979. Catches in the northeast Atlantic accounted for 25 percent of total small pelagic landings in the latter year. The significant development, however, was the almost yearly contraction of atlantic herring catches. Between 1970 and 1979, catches of this species in the northeast Atlantic fell 73 percent, and 1978 saw the closure of the North Sea and Scottish herring fisheries to permit the rebuilding of stocks. Catches of atlantic mackerel in this area advanced smartly through 1976, but the following three years witnessed a substantial reduction in landings from the 1976 peak. Catches of sprat, nearly all of which were made in the northeast Atlantic, registered a similar impressive advance then retreat, as did those of norway pout, polar cod and atlantic horse mackerel. The latter three species are caught exclusively in the northeast Atlantic. Catches of capelin and blue whiting for fish meal production recorded very impressive increases during the past decade, the two species accounting for fully 59 percent of all small pelagic landings in the area in 1979. European pilchard landings remained relatively stable in recent years, while those of european anchovy exhibited a strong upward trend.

Appendix table B-4

Small pelagic catches in the Northeast Atlantic
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	4662	4926	5131	5578	5522	6043	6943	6893	6389	6827
Contiguous Countries										
Norway					1655	1709	2557	2541	1762	
U.S.S.R.					882	1274	1411	1234	1173	
Iceland					522	523	508	872	1065	
Denmark					883	918	792	674	659	
United Kingdom					315	267	310	361	474	
Spain					200	227	260	245	281	
Faeroe Islands					162	188	222	175	183	
Portugal					138	150	141	149	127	
Sweden					142	142	127	133	137	
Poland					171	184	180	121	112	
Finland					75	73	81	81	92	
Netherlands					72	92	77	65	78	
Ireland					55	46	46	55	73	
German Dem. Rep.					95	107	88	85	70	
Germany, Fed. Rep.					57	33	18	36	66	
France					79	70	71	62	63	

The northeast Atlantic is the primary source of raw material for many of the major canners of small pelagics. Norway, the U.S.S.R. and Iceland caught the heaviest volumes in this area, but virtually all contiguous countries caught significant tonnage.

Eastern-central Atlantic

Catches in this area accounted for slightly over five percent of world-wide small pelagic landings in 1979, down from almost nine percent in 1977. Area catches fell by 34 percent in 1978 and 1979 after steady expansion the preceding six years. This decline was due to the sharp drop in catches by distant-water fleets of non-contiguous countries, particularly those of the U.S.S.R., Poland, Romania and Bulgaria; the U.S.S.R. accounted for the bulk (nearly 80 percent in 1978) of these catches. Landings in contiguous countries remained relatively stable in recent years. Catches by these countries accounted for slightly more than 40 percent of total area catches in 1978, compared to only 29 percent the previous year. Morocco, Ghana, Senegal and Spain were the most important coastal producers in this area.

Appendix Table B- 5

Small pelagic catches in the Eastern-Central Atlantic
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	1785	1686	1722	1759	1779	1903	2029	2118	1579	1392
Contiguous Countries					625	567	667	619	654	
Morocco					233	193	244	196	235	
Ghana					75	74	78	92	131	
Senegal					136	128	133	135	128	
Spain					85	77	118	117	91	
Ivory Coast					36	34	36	34	30	
Sierra Leone					38	39	40	30	27	
Nigeria					8	9	7	7	7	
Congo					6	5	6	5	5	
Togo					7	9	6	3	...	
Non-contiguous Countries					992	1145	1254	1258	705	
U.S.S.R.					822	903	1058	918	560	
Romania					27	73	34	74	48	
Poland					32	86	120	189	48	
Bulgaria					13	43	24	46	30	
German Dem. Rep.					2	2	7	19	8	
Japan					7	8	4	6	5	
Greece					5	1	5	4	...	
Portugal					1	1	1	1	2	
Norway					78	13	-	-	-	
France					5	5	1	1	-	
Iceland					-	11	-	-	-	
Catches by unspecified countries					104	168	82	218	200*	

Smaller catches of chub mackerel, european pilchard and unspecified jack and horse mackerels accounted for most of the decline in landings in the eastern-central Atlantic in 1978 and 1979. Catches of Sardinellas and anchovies registered sizable increases over the past decade, particularly those of round sardinella, which rose from zero to nearly 100 thousand tons between 1974 and 1978.

Production levels in 1978 and most recent available estimates of production potential in the eastern-central Atlantic are summarized below.

Appendix table B- 6

Recent production and future potential - Eastern-Central Atlantic
(1000 m.t.)

	Landings (1978)	Est. potential
All pelagic species	1579	2 - 2500 1/
European pilchard	436	> 500 1/
Morocco & Spain (Canary Is.)	223	
Non-contiguous countries	213	
Sardinella spp.	443	> 770 - 860? 2/
W. Sahara, Mauritania, Gambia, Senegal & Guinea-Bissau	99	600 3/
Sierra Leone, Liberia, Ivory Coast & Ghana	98	170 - 260 2/3/4/
Other contiguous countries	5	not avail.
Non-contiguous countries	138	—
Catches in unspecified countries	103	
Jack & horse mackerels	330	> 700?
Morocco south to Guinea	68	700 3/
Sierra Leone south to Zaire	2	not avail.
Non-contiguous countries	260	—
Chub mackerel	75	> 170 - 200?
Morocco south to Guinea	45	170 - 200 3/
Sierra Leone south to Zaire	1	not avail.
Non-contiguous countries	29	—

1/ Gulland, 1978

2/ Includes 100,000 ton estimate for both sardinella spp. and bonga off Sierra Leone.

3/ Boely, T., 'Les ressources en poissons pelagiques des côtes ouest-africaines entre le détroit de Gibraltar et le fleuve Congo'. (unpub.)

4/ Talarczak, K., 'Industrial marine fisheries in the CECAF area, part I: Morocco to Liberia'. CECAF/Tech/76/3. Dakar.

The eastern-central Atlantic is an area rich in small pelagics, as the levels of production in 1978 and 1979 clearly indicate. Appendix Table B-7 also seems to indicate that area production may be increased further; it must be remembered, however, that catches in this area exceeded two million tons in both 1976 and 1977.

Of the important species, jack and horse mackerels and possibly bonga appear to offer the best opportunities for expanded production - the former species, especially off Mauritania and in the Gulf of Guinea, and the latter species (for which no definitive estimates of potential are available) off Gambia, Senegal, Guinea-Bissau, Sierra Leone, as well as other countries. Sardinellas also show further potential off Sierra Leone and other countries. Catches of the important european pilchard dropped 60 percent between 1976 and 1979, and stocks may already be producing near their maximum yield. The picture for chub mackerel is

unclear. Catches of this species in 1977, at 170 thousand tons, were at the lower estimate of potential for the northern sector of the eastern-central Atlantic, but recorded substantially reduced levels in 1978 and 1979. Catches of anchovies increased sharply in recent years, particularly in 1978, but no assessment of these stocks is available.

Southeast Atlantic

Small pelagic catches in this area increased substantially between 1970 and 1978, registering a 24 percent increase in 1978 alone. Southeast Atlantic catches contributed nearly nine percent of total small pelagic production in the latter year, up from five percent in 1970. During this period, however, there was a marked change in the species composition and national distribution of landings. Whereas contiguous countries - Angola, Namibia, South Africa and Zaire - accounted for nearly all catches up to 1972, by 1978 these countries contributed only 41 percent of the area total. Non-contiguous countries, dominated by the U.S.S.R. and Poland but joined by a number of smaller producers (see below) accounted for the balance, showing substantial increases in tonnage in 1977 and 1978.

Appendix table B-7

Small pelagic catches in the Southeast Atlantic
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	1417	1371	1538	1805	1748	1657	1648	1775	2199	1687
Contiguous Countries					1571	1322	1049	865	896	838
Namibia					837	759	573	402	414	324
South Africa					415	421	422	381	389	431
Angola					315	138	53	82	90	83
Zaire					3	3	2	-	-	
Non-contiguous Countries					186	332	603	908	1306	
U.S.S.R.					117	183	454	701	1005	
Poland					25	38	52	82	129	
Cuba					-	11	9	15	50	
German Dem. Rep.					-	-	1	8	29	
Romania					-	-	7	3	28	
Bulgaria					4	21	17	36	27	
Japan					21	45	30	37	26	
German Fed. Rep.					-	-	0	4	7	
Spain					-	4	5	4	4	
Ghana					19	31	29	17	2	
Portugal					0	0	1	2	0	

The decline in landings in contiguous countries were the result of the dislocating effects of war (in Angola), and the demise of south african pilchard stocks. Additionally, catches of chub mackerel by South African fishermen fell from almost 70 thousand tons in 1975 to zero in 1978. Cape anchovy and red-eye round herring landings (the latter in South Africa) were the only real bright spots for contiguous nations. The distant-water fleets

of non-contiguous countries caught increasingly heavy volumes of cunene and cape horse mackerels, chub mackerel and unspecified sardinellas. Of particular interest was the apparent shift of fishing effort by distant-water fleets in 1978 from the eastern-central to southeast Atlantic; comparison of Appendix tables B-5 and B-8 shows that the sharp drop of catches by non-contiguous nations in the eastern-central Atlantic was nearly matched by the equally sharp increase in catches by these countries in the southeast Atlantic.

Available estimates of potential in the southeast Atlantic are summarized below.

Appendix table B-3

Recent production and future potential - Southeast Atlantic
(1000 m.t.)

	Landings (1978)	Est. potential
All pelagic species	2199	
Angola, Namibia & South Africa	393	
Non-contiguous countries	1305	
South african pilchard	149	
Angola	-	100 1/
Namibia	45	500 - 1000 2/
South Africa	99	
Cape & cunene horse mackerels	930	
Angola	42	210 1/
Namibia	9	100 - 500 2/
South Africa	16	
Non-contiguous countries	863	—
Cape anchovy	564	
Namibia	360	200 2/
South Africa	204	
Sardinellas	241	
Angola	46	110 1/
Non-contiguous countries	195	—

1/ FAO. Report SIDA fisheries delegation to Angola, 1978.
2/ Troadec, J.-P., W.G. Clark & J.A. Gulland, 'A review of some pelagic fisheries in other areas'. Document No. 10 of Symposium of the Biological Basis of Pelagic Fish Stock Management, Aberdeen. International Council for the Exploration of the Sea. (in press); and
Newman, G., 'The living marine resources of the South East Atlantic'. FAO, FIR/T 178(En.) 1978.

Western-central Atlantic

Annual catches in this area exhibited an essentially stable trend in the past decade except for three years of sharply higher production in 1971, 1978 and 1979. Area production in the latter year accounted for almost four percent of total small pelagic landings, up from 2.4 percent in 1970. Catches were dominated by gulf menhaden, which provided over 80 percent of total area small pelagic production in 1979 and was the basis of the heavier

catches in that year as well as in 1971 and 1978. Atlantic menhaden, round sardinella, atlantic spanish mackerel and unspecified clupeoids were the other species of importance in the western-central Atlantic. Menhaden is only used for fish meal production.

Appendix table B- 9

Small pelagic catches in the Western-C ntral Atlantic
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	696	882	669	631	724	717	730	606	984	969
Contiguous Countries										
United States					675	643	661	547	931	
Venezuela					38	59	52	47	39	
Mexico					9	8	7	8	8	
Cuba					3	3	3	4	4	
Trinidad & Tobago					1	2	2	2	2	
Colombia					2	2	1	1	1	

Contiguous countries made virtually all catches of small pelagics in the area, with the United States alone accounting for 90 percent or more in recent years. Venezuela was the other producer of note, but landings there declined each year after 1975. Mexico, Cuba, Trinidad and Tobago, and Colombia all recorded small catches in the western-central Atlantic.

Available estimates of production potential as well as the levels of 1978 landings in this area are summarized below.

Appendix table B- 10

Recent production and future potential - Western-Central Atlantic
(1000 m.t.)

	Landings (1978)	Est. potential
All pelagic species	98	2500 - 4500 1/
Gulf & atlantic menhaden	914	500 1/
U.S.A.	914	500
Round sardinella	30	80
Venezuela	28	80 2/
Atlantic thread herring	4	35
Colombia	0	35 3/
Other countries	4	not. avail. 4/
Other sardinellas & clupeoids	17	885 - 1885 1/
Other pelagic species	22	1000 - 2000 1/

1/ Gulland, 1978.
2/ FAO, 1973. Informe terminal, FI : DP/VEN/66/514.
3/ FAO, 1973. Informe terminal, FI : DP/COL/66/552.
4/ Included in estimated potential of 'other Sardinellas and Clupeoids'.

As may be seen above, there appears to be significant scope for the expansion of catches of pelagic species in the western-central Atlantic.

Northwest Pacific

Annual production of small pelagics in the northwest Pacific advanced steadily after 1970, and by 1979 this area contributed over 20 percent of world-wide small pelagic landings. A more than hundred-fold expansion in landings of japanese pilchard fueled the expansion of catches in the northwest Atlantic, this species alone accounting for 37 percent of area production in 1979. Very substantial (40 percent of the area total in 1979) and growing volumes of chub mackerel landings also played an important role. Other important species which recorded increased catch levels were round scad, japanese spanish mackerel and indo-pacific king mackerel. Pacific herring registered a sharp decline in landings in 1976 and in 1978, as did japanese jack mackerel and japanese anchovy.

Appendix table B-11

Small pelagic catches in the Northwest Pacific
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	3155	3210	3315	3706	3640	3784	3728	4645	5412	5502
Contiguous Countries										
Japan					2476	2705	2751	3569	4035	
U.S.S.R.					580	746	507	280	551	
Korea, Rep.					299	289	302	350	382	
China					284	242	234	257	390	
Hong Kong					15	18	20	18	16	

Contiguous countries made all catches of small pelagics in this area, with Japan accounting for the bulk (75 percent in 1973). Japanese catches in the northwest Atlantic expanded substantially in recent years, as did those of the Republic of Korea and China. Production in this area by the U.S.S.R. dropped sharply in 1976 and particularly in 1977, but recovered impressively during 1978 and 1979.

Western-central Pacific

Catches in this area expanded 90 percent between 1970 and 1977, then declined moderately in 1978 and 1979; in the latter year area production still contributed almost five percent of world-wide small pelagic landings, up from less than three percent in 1970. Scads contributed the heaviest volumes to landings in this area, followed by sardinellas, indian mackerels and anchovies. Landings of sardinellas registered the largest increase in recent years, but those of scads also rose. Catches of anchovies and indian mackerels remained relatively stable. Other species of importance were rainbow sardines, short-mackerel and king mackerels.

Appendix table B-12

Small pelagic catches in the Western-Central Pacific
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	750	1014	891	1045	1090	1146	1170	1425	1390	1305
Contiguous Countries										
Philippines					531	543	519	585	484	
Thailand					190	214	261	446		
Indonesia					282	328	313	344	355	
Malaysia, Penn.					89	71	82	96	106	
Malaysia, Srk.					3	7	5	5	7	
Malaysia, Sbh.					4	4	4	2	1	
Papua New Guinea					1	1	1	2	2	
Australia					1	1	1	1	1	

Virtually all small pelagic catches in the western-central Pacific were landed in contiguous countries, with the Philippines, Thailand, Indonesia and Peninsular Malaysia accounting for nearly all of the area total. Annual landings in the latter two countries advanced steadily through 1979 as catches of most major species improved. After impressive expansion through 1977, production in both Thailand and the Philippines contracted during the following two years. In the latter country, traditional grounds - particularly those in the Visayas (the central Philippines) - produced stable or reduced catches despite increased fishing effort. Escalating fuel oil prices forced many operators to concentrate their activities to these proximate fishing areas. Thai fishermen on the other hand found some of their more productive fishing grounds closed to them with the extension of EEZs by neighbouring countries.

Like most tropical waters, the western-central Pacific is characterized by a large variety of species. Consequently, assessments of pelagic production potential are indicated by country or certain ocean areas only; where production potential has been estimated by species in these areas, these data are also presented in Appendix table B-14. In most cases, however, data describing current catch levels by sub-area within the western-central Pacific are unavailable. Additionally, the difficulty of definitively differentiating between pelagic and demersel species in tropical fisheries which are often of small scale and prosecuted in small inshore waters should be borne in mind when examining Appendix table B-14. Because of this imprecision in defining pelagic species in these waters, estimates of production potential for 'pelagic' species shown below may include species not defined as pelagic for the purposes of this study.

Appendix table B-13

Recent production and future potential - Western-Central Pacific
(1000 m.t.)

	Landings (1978)	Est. Potential
All pelagic species	1390	> 5000
Philippines	543	950
Inshore waters		650 1/
Offshore waters		300 1/
Thailand	471	
Gulf of Thailand		380 2/
Indian mackerels (Rastrelliger brachysoma)		60 - 90 1/
Indian mackerels (R. anagurta)		40 1/
Clupeoids		30 1/
Malacca Strait		300 2/
Indian mackerels (Rastrelliger spp.)		100 3/
Anchovies		42 3/
Round scade		28 3/
Sardines		17 3/
Indonesia	355	6
Java Sea and assoc. waters		1000 2/
Bali Strait		
Indian oil-sardine		50 - 220 4/
West Irian		100 2/
Karimata Strait		340 2/
Penn. Malaysia	106	> 211
East Coast		130 2/
Schooling pelagics		56 - 75 1/
West Coast		
Schooling pelagics		31 1/
Malaysia, Sabah and Sarawak	8	
Sulu Sea		150 2/
Sarawak Bay and Sabah		600 2/
Vietnam		
Southern coastal waters		50 2/
Off Mekong Delta		570 2/
Horse mackerels, scads and skipjack		775 1/

1/ Menesveta, D., S. Shindo and S. Chullasorn. 'Pelagic fishery resources of the South China Sea and prospects for their development'. FAO, SCS/DEV/73/6/Rome. 1973.

2/ Tussing, A.R. 'Fishery Development Prospectives, South China Sea.' FAO, FI : SCS/75/WP/6, 1975.

3/ FAO. 'Report of the workshop on the fishery resources of the Malacca Strait - Part II'. SCS/GEN/76/6, 1976.

4/ FAO. 'Report of the joint mission to plan development of the sardinella fisheries in the Bali Strait. IOP/GEN/76/6, 1976.

A direct comparison of current catch levels with estimated production potentials in the western-central Pacific, as shown in above table, is difficult due to the non-comparability of the data. However, it may be seen that total catches in the area of 1390 thousand tons in 1978 were less than one-third of the estimated potential for only selected sub-areas of the western-central Pacific.

Eastern-central Pacific

Catches in this ocean area recorded impressive advances through 1979, and accounted for almost five percent of world-wide small pelagic landings in that year. The eastern-central Pacific contributed less than one percent of the world-wide total in 1970. The expansion of area production was based on an over fifteen-fold increase in landings of pacific thread herring - all in Ecuador and Panama, substantial growth of north pacific anchovy landings in Mexico and the United States, an over five-fold expansion of californian pilchard in Mexico, and a marked increase in Panamanian landings of central pacific anchoveta. Pacific jack mackerel and crub mackerel were also important species in the eastern-central Pacific. However, landings of the former species, as well as those of central pacific anchoveta, registered substantial reductions in recent years.

Appendix table B-14

Small pelagic catches in the Eastern-Central Pacific
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	225	223	261	383	388	597	736	1049	1062	1236
Contiguous Countries										
Ecuador					110	175	225	383	550	
Mexico					130	138	228	309	354	
Panama					52	64	135	189	95	132
United States					94	164	136	164	62	
Colombia					2	3	6	5		

Contiguous countries accounted for virtually all small pelagic catches in this area. Ecuador and Mexico were the leading producers, followed by Panama, the United States and Colombia.

Available data describing production potential for the eastern-central Pacific are summarized in the following table.

Appendix table B-15

Recent production and future potential - Eastern-Central Pacific
(1000 m.t.)

	Landings (1978)	Est. Potential
All pelagic species	1062	2940 - 3940
Californian pilchard and south pacific anchovy	352	2000 1/
Mexico	336	not avail.
United States	16	not avail.
Pacific jack mackerel	31	300 - 800 1/
United States	31	not avail.
Mexico	-	not avail.
Chub mackerel	25	40 1/
Mexico	14	not avail.
United States	11	not avail.
Central pacific anchoveta and pacific thread herring	650*	600 - 1000
Mexico	21 2/	100 3/
Panama	95	500 - 1000 4/
Colombia	5*	
Ecuador	550	

1/ Gulland, J.A. 'The fish resources of the ocean', rev. 1, FAO 1972
2/ 1976 landings of pacific thread herring at Guaymas only.
3/ Guesstimate for the Gulf of California and south based on 1/
4/ Gulland, 1978. Panama, Colombia and Ecuador sharing.

Catches of small pelagics in waters of the eastern-central Pacific contiguous to the southwestern continental United States, Mexico, Central America, Colombia and Ecuador are currently well below the estimated production potential of these waters. Catches of californian pilchard and north pacific anchovy by the United States and Mexico in 1978 were less than 20 percent of the estimated potential of these stocks in the California current, which sweeps along the northwestern coast of Mexico and the west coast of the United States. Pacific jack mackerel and chub mackerel stocks in the California current - particularly the former, also show potential for more intensive exploitation.

Mediterranean and Black Sea

Catches in this area improved slightly during the past decade, but still accounted for less than three percent of total small pelagic production in 1979. The principal sources of production in the Mediterranean and Black Sea were european anchovy - landings of which declined after 1974, but still accounted for over 50 percent of the area total in 1979 - and european pilchard. Landings of the latter species apparently stabilized after 1976. Other species of importance were jack and horse mackerels, atlantic mackerel and sprat.

Appendix table B-16

Small pelagic catches in the Mediterranean and Black Sea
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	506	545	593	593	822	686	748	641	655	723
Contiguous Countries										
U.S.S.R.					268	206	295	189	180	
Italy					141	111	109	100	121	
Turkey					204	147	102			
Spain					67	77	84	83	85	
Greece					26	28	33	31		
Yugoslavia					23	25	27	27	30	
Morocco					17	13	22	28	26	
Algeria					28	30	27	35	25	
Tunisia					17	12	13	13	16	
France					18	22	16	16	15	
Bulgaria					7	8	9	10	11	
Romania					3	2	6	4	5	
Egypt					1	1	1	1	2	

Virtually all catches in this area were landed in contiguous countries. The U.S.S.R., Italy, Turkey and Spain were the leading producers, accounting for about 75 percent of total area production in 1978. Catches by the U.S.S.R. dropped off after 1976 due to reduced landings of european pilchard, which made up the bulk of Russian catches in the Mediterranean and Black Sea. Landings in Turkey were halved between 1974 and 1976 because of reduced european anchovy production. Spanish, Greek, Yugoslav, Moroccan and Bulgarian catches in the Mediterranean and Black Sea all witnessed moderate expansion in recent years.

Available estimates of production potential for selected species and areas in the Mediterranean and Black Sea, as well as 1978 catch levels, are presented in Appendix table B-17.

The Mediterranean as a whole is not an area of abundant fish resources. This is particularly true of the southern region along the coast of North Africa, with the possible exception of Tunisian waters. The Black Sea may be richer, at least in underutilized pelagic resources. Small pelagic production potential for both areas has been estimated at one million tons per year, about 50 percent greater than total catches in 1978.

Appendix table B-17

Recent production and future potential - Mediterranean and Black Sea
(1000 m.t.)

	Landings (1978)	Est. potential
All small pelagic species	655	1000 1/
European pilchard	187	>80 - 170
Algeria	20	10 - 100 2/
Morocco	15	10 2/
Tunisia	11	20 2/
Libya	-	10 2/
France	11	20 1/7/
Egypt and Israel	-	10 2/
Spain, Italy, Yugoslavia, Greece, Turkey	131	not avail.
European anchovy	344	> 280
Morocco and Algeria	10	10 2/
Turkey	80 3/	270 4/5/
Other contiguous countries	253	not avail.
Sprat	39	> 30?
Bulgaria, Romania & U.S.S.R.	35	30 1/5/
Sardinella spp.	8	> 40?
Tunisia	2	10 2/
Libya	1	10 2/
Egypt	2	10 2/
Israel and Lebanon	2 6/	10 2/
Horse mackerels	54	> 70
Algeria	1	10 2/
Turkey	20 3/	60 4/5/

1/ Grantham, G.J. 'The utilization of small pelagic fish in the GFCM area.' FAO, GFCM/XIV/78/12. 1978

2/ FAO. 'Atlas of the living resources of the seas'. Fisheries circular, no. 126-Rev. 1. 1972

3/ 1976 production.

4/ FAO/World Bank Cooperative Programme, Report of the Turkey Fisheries Project Preparation Mission, Vol. I. Report No. 9/76-TUR.17. 1976.

5/ Black Sea only.

6/ Including the Gaza Strip.

7/ Estimate for the Gulf of Lions only.

Western Indian Ocean

Annual production of small pelagics in this area rose steadily between 1974 and 1978, but apparently contracted in 1979. In the latter year, the western Indian Ocean contributed over two percent of world-wide landings of small pelagic species. Indian oil-sardine was the principal source of area production, catches more than doubling between 1973 and 1978 and accounting for 46 percent of the area total in the latter year. Catches of anchovies,

the second most important source of production, increased over five-fold between 1973 and 1975, then stabilized thereafter. Indian mackerels, clupeoids and sardinellas were the other species of importance; the latter species group recorded a more than ten-fold expansion in landings during 1975 (most probably a statistical artifact).

Appendix table B-18

Small pelagic catches in the Western Indian Ocean
(1000 m.t.)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Total	556	616	461	402	472	634	656	717	780	679*
Contiguous Countries										
India					299	295	303	305	354	
Oman					...	165	165			
Yemen, Dem.					110	107	112	115	95	
Pakistan					9	7	9	19	77	
Sri Lanka					29	36	43	50	58	
Ethiopia					20*	20*	20*	20*	20*	
Yemen Arab Rep.					7	8	9	10	11	
Tanzania					2	3	6	7	8	
Egypt					4	3	3	0	0	
Non-contiguous Countries					5	1	1	38	9	
U.S.S.R.					4	1	1	36	8	
Japan					1	0	0	2	1	

India was by far the leading producing nation in this area, recording heavier production levels in recent years on the strength of increased indian oil-sardine landings. Oman, the People's Democratic Republic of Yemen, Pakistan and Sri Lanka were the other major producers in the western Indian Ocean. Among non-contiguous countries, the U.S.S.R. registered catches of notable volume in 1977 and 1978.

Data describing small pelagic potential in this area are particularly tenuous. Most estimates must be based on biomassly limited surveys.

Available data indicates Stolephorus anchovies show the best potential for expanded catches. Conclusions with respect to other species is unwise without knowledge of what portion of total western Indian Ocean catches were made off the southwestern coast.

Appendix table B-19

Recent production and future potential - Western Indian Ocean
(1000 m.t.)

	Landings (1978)	Est. potential
India, western Indian Ocean	354	
Indian oil-sardine	204	
Anchovies n.e.i.	47	
Clupeoids n.e.i.	9	
King mackerels n.e.i.	15	
Indian mackerel	79	
		900 1/
Southwestern Coast of India		
Indian oil-sardine		200 2/
Stolephorus spp. (anchovies)		170 2/
Indian mackerel		100 2/
Horse mackerels 3/		50 2/

1/ Based on pelagic biomass estimate of 1.8 million tons: FAO, Report of acoustic survey along the Southwest Coast of India, November 1976. Phase II. Progress Report 1. UNDP/FAO Pelagic Fishery Investigation Project of the Southwest Coast of India. FIRS-IND/75/038. 1977

2/ Guesstimates based on average standing stock estimates: Kumaran, M. 'Our fisheries resources and the role of upwelling in their fluctuations Part II: Primary production and fisheries potential'. Seafood Export Journal, Vol. X, No. 2 (Feb. 1978), Cochin, India.

3/ Megalaspis, Decapterus and Caranx spp.

Southwest Atlantic, Northeast Pacific, Southwest Pacific and Eastern Indian Ocean

These four ocean areas consistently produced relatively small volumes of small pelagic species during the past decade. The southwest Atlantic was the largest producer among these areas, at almost 250 thousand tons in 1978. Nearly all these landings were comprised of anchoita (argentine anchovy) and unspecified anchovies and Sardinellas in Brazil and Argentina. Catches in the eastern Indian Ocean totalled only 141 thousand tons in 1978, and comprised for the most part of indian mackerels, indian oil-sardine and unspecified anchovies, Clupeoids and king mackerels in India, Indonesia and Thailand. Northeast Pacific catches totalled less than 100 thousand tons in 1978, made up almost completely of pacific herring. The United States and Canada accounted for almost all catches in this area after 1976. The southwest Pacific produced only ten thousand tons in 1978, down from 25 thousand tons the previous year. Japan and the Republic of Korea accounted for most catches.

A P P E N D I X C

Import Tariffs

A P P E N D I X C

Duties Assessed on Canned Small Pelagic Products by Major Importing Nations

Country	Sardine A	Sardine C	Sardine G	Mackerel G	Anchovy G	Herring A	Herring C	Herring G	Others A	Others C	Others G	Import Surcharges
United Kingdom 1/	25	25				23	20		25	20		V.A.T. 15% on turnover
France 1/	"	"				"	"		"	"		V.A.T. 7% on turnover; custom stamp tax 2% on customs charges
Germany, Fed.Rep. 1/	"	"				"	"		"	"		V.A.T. 6% on turnover
Italy 1/	"	"				"	"		"	"		V.A.T. 6% on turnover
Belgium-Luxembourg 1/	"	"				"	"		"	"		V.A.T. 6% on turnover
Netherlands 1/	"	"				"	"		"	"		V.A.T. up 12% C.I.F. value
Austria				not available								
Switzerland				not available								
Sweden			15	40								V.A.T; 20.63% custom value plus duty, all taxes
Nigeria			5	5	5			5			5	5% on all C.I.F. value
Egypt			2								1	Economic Development Tax 5% on C.I.F. value; Statistical Tax 1% on C.I.F. value.
Zaire			0 2/					0			10	
Ghana			35	35	35			35			35	
South Africa				not available								
Philippines			10	10							70	
Malaysia			0	0	0			0			0	Sales Tax 5% on duties value; 5% surtax
Singapore			0	0	0			0			0	
Indonesia			70	70	70			70			70	Sales Taxes 5.1 and 20% C&F value (rates vary)
Sri Lanka			0	0	0			0			0	
United States				see Attachment A								
Canada				see Attachment B								
Jamaica			3	3	25			3			25	Tonnage tax by weight; Surtax 10-20% of duties
Dominican Republic				see Chapter 3 p.								Internal Consumption Tax 20% ad valorem; Surcharge 4% all customs charges
Saudi Arabia				not available								
Papua New Guinea			0	0	0			0			0	2.5% value; some exempted
Australia			0	0	0			0			0	
Fiji			50	50	50			50			50	
Colombia 3/			45		45						55	Ad valorem 5% C.I.F. value
Bolivia 3/				see Attachment C								

Notes to Appendix C

A = Autonomous rates apply to countries which have not concluded any special agreement with EEC.

C = Conventional rates of 'most favoured nation' rates apply to contracting parties of GATT or nations which the EEC has granted a favourable rate.

G = General rate

V.A.T. = Value added tax

1/ EEC countries exempted from all duties and import surcharges.

2/ Also pilchard

3/ Latin American Free Trade Association (LAFTA) member countries granted duty preference exempted from import surcharges. Preferences on duties also granted Andean Group members countries on specifically negotiated items. LAFTA : Argentina, Brazil, Chile, Colombia, Ecuador, Mexico, Paraguay, Peru, Uraguay and Venezuela. Andean Group : Colombia, Ecuador, Peru and Venezuela.

ATTACHMENT A

TARIFF — USA

CODE		CATEGORIES	RATES OF DUTY		
			Most favoured nations	Less Developed countries	All other countries
		Subpart C - Fish in Airtight Containers			
		Fish, prepared or preserved in any manner, not in oil, in airtight containers :			
		Anchovies :			
112.01	00	- In containers weighing with their contents not over 15 pounds each . . .	6.5% ad val.	5% ad val.	25% ad val.
112.03		- Others	1.7% ad val.	Free	2.5% ad val.
112.05	00	Bonito and yellowtail	6% ad val.		25% ad val.
		Herring :			
		- In containers not weighing with their contents not over 15 pounds each . . .			
112.08	00	In tomato sauce, smoked, or kippered, and in immediate containers weighing with their contents over 1 pound each	4% ad val.		25% ad val.
112.10	00	- Other	Free		25% ad val.
112.12	00	Other	0.6% ad val.	Free	2% ad val.
112.14	00	Pollock	6% ad val		25% ad val.
112.18	00	Salmon	6.4% ad val.	3% ad val	25% ad val.
		Sardines :			
112.20	00	- In containers weighing with their contents not over 15 pounds each			
		In immediate containers weighing with their contents under 8 ounces each . .	4.4% ad val.	2.5% ad val.	25% ad val.
		Other.	6.25% ad val.		25% ad val.
		- Other.	1.7% ad val.		4% ad val.

CODE		CATEGORIES	RATES OF DUTY 1	LDDC	2
		Tuna:			
		In containers weighing with their contents not over 15 pounds each, for an aggregate quantity entered in any calendar year not to exceed 20% of the United States pack of canned tuna during the immediately preceding calendar year, as reported by the United States Fish and Wildlife service.....	6% ad val		25% ad val.
		Albacore			
		Other			
		Other	12.5% ad va.		25% ad val
		Other.....	6% ad val		25% ad val
		Mackerel			
		Other			
		Fish prepared or preserved in any manner, in oil, in airtight containers:			
		Anchovies	6% ad val		30% ad val
		Bonito and Yellowtail	6.9% ad val.	4.9% ad val.	30% ad val
		Herring	11.4% ad val.	8% ad val	30% ad val
		Pollock:			
		Smoked	7.5% ad val		30% ad val
		Not Smoked	12.5% ad val.		30% ad val
		Salmon	12.5% ad val.		30% ad val.

CODE		CATEGORIES	RATES OF DUTY 1	LDDC	2
		Fish, prepared or preserved, etc. (con.):			
		Sardines:			
112.54	00	Valued not over 18 cents per pound (including weight of immediate container)	25.5% ad val	12% ad val	30% ad val
		Valued over 18 but not over 23 cents per pound (including weight of immediate container):			
		Neither skinned nor boned:			
112.58	00	Smoked.....	11.5% ad val.		30% ad val
112.62	00	Not smoked	20% ad val.		30% ad val.
112.66	00	Skinned or boned	20% ad val.		30% ad val.
		Valued over 23 but not over 30 cents per poind (including weight of immediate container):			
		Neither skinned nor boned:			
112.71	00	Smoked	11.5% ad val		30% ad val
112.73	00	Not smoked	15% ad val		30% ad val
112.74	00	Skinned or boned	30% ad val		30% ad val
		Valued over 30 cents per pound (including weight of immediate container):			
		Neither skinned nor boned:			
		Smoked:			
112.79	00	Valued 45 cents or more per pound in tin-plate containers or 50 cents or more per pound in other containers.....	5.5% Ad val	4% ad val	30% ad val

ATTACHEMENT B

CANADA

TARIFF

CODE	CATEGORIES	British Preferential Tariff	Most Favoured Nation Tariff	General Tariff	Generalized System of Preference Tariff
11700.1	Fish Livers - fresh, salted or in preservative medium	free	free	free	free
	Sardines, sprats or pilchards, packed in oil or otherwise, in sealed tin containers; the weight of the tin container to be included in the weight for duty:				
11901.1	When weighing over 20 oz. and not over 36 oz each.	1.63¢	1.63¢	6¢	--
11902.1	When weighing over 12 oz. and not over 20 oz. each.	1.38¢	1.38¢	4.5¢	1¢
11903.1	When weighing over 8 oz and not over 12 oz. each .	0.92¢	0.92¢	3.5¢	2.3¢
11904.1	When weighing 8 oz. each or less	0.69¢	0.69¢	2.5¢	0.5¢
	Anchovies, packed in oil or otherwise, in sealed tin containers; the weight of the tin container to be included in the weight for duty:				
1200.1	When weighing over 20 oz. and not over 36 oz. each. G.P.T. rate to 30/6/84	1.38¢	1.38¢	6¢	Free

CODE	CATEGORIES	British Preferential Tariff	Most Favoured Nation Tariff	General Tafiff	Generalized System of Preference Tariff
120021.	When weighing over 12 oz. and not over 20 oz. each	1.13¢	1.13¢	4½¢	Free
12003.1	When weighing over 8 oz. and not over 12. oz. each G.P.T. rate to 30/6/84	0.69¢	0.69¢	3.5¢	Free
12004.1	When weighing 8 oz each or less G.P.T. rate to 30/6/84	0.44¢	0.44¢	2.5¢	Free
12100.1	Fish preserved in oil, n.o.p.	15p.c.	15 p.c.	35 p.c.	14 p.c.
12015.1	Bonito preserved in oil	9.3 p.c.	9.3 p.c.	35 p.c.	7 p.c.
12200.1	Herring (not including kippered herring in sealed containers) packed in oil or otherwise, in sealed containers.	10 p.c.	10 p.c.	35 p.c.	8 p.c.
	Fish prepared or preserved, n.o.p:				
12301.1	Kippered herring sealed containers	7 p.c.	7 p.c.	30 p.c.	6 p.c.
12302.1	Salmon	6.4 p.c.	6.4 p.c.	30 p.c.	3 p.c.
2303.1	All other fish	11 p.c.	11 p.c.	30 p.c.	--
12304.1	New Zealand Trade Agreement - Canned White bait (Free)				

ATTACHMENT C

BOLIVIA

TARIFF

CODE		CATEGORIES	DUTY	ADDITIONAL TAX
03.01		Fish - fresh (live or dead), chilled or frozen:		
	01.00	Dead fish - fresh, chilled or frozen		
	02.00	For industrial breeding or hatching		
	89.00	Other:		
	01	For ornamentation	20%	10%
	99	Other	10%	20%
03.02		Fish simply salted or in brine - dried or smoked:		
	01.00	Dried, salted or in brine:		
	01	Cod	20%	
	99	Other	20%	
	02.00	Smoked	20%	
	03.00	Fish flour suitable for human consumption	50%	
03.03		Crustaceans and Molluscs, whether in shell or not - fresh (live or dead), chilled, frozen, dried, salted or in brine; crustaceans in shell, simply boiled in water:		
	01.00	Fresh or chilled:		
	01	Lobsters	20%	20%
	02	Prawns	20%	20%
	03	Camarones	20%	20%
	99	Other	20%	20%
	02.00	Frozen:		
	01	Lobsters	20%	20%
	02	Prawns	20%	20%
	03	Camarones	20%	20%
	04	Other	20%	20%
	03.00	Dried, salted or in brine:		
	01	Camarones	20%	10%
	99	Other	20%	10%
	89.00	Other:		
	01	Flours suitable for human food	20%	30%
	99	Other	20%	30%

CODE		CATEGORIES	DUTY	ADDITIONAL TAX
16.04		Prepared or preserved fish, including caviar and its substitutes		
	01.00	Of tuna	30%	
	02.00	Of bonito	30%	
	03.00	Of salmon:		
	01	In containers with a net content greater than 250 gr	0	
	02	In containers with a net content equal to or less than 250 gr	20%	
	04.00	Of sardine:		
	01	In containers with a net content greater than 250 gr	0	
	02	In containers with a net content equal to or less than 250 gr	20%	
	05.00	Of sardine-type fish:		
	01	In containers with a net content greater than 250 gr	0	
	02	In containers with a net content equal to or less than 250 gr	20%	
	06.00	Of anchovy	40%	10%
	07.00	Caviar and its substitute	40%	10%
	89.00	Other:		
	01	In paste	40%	10%
	02	Sausages	40%	10%
	99	Other	40%	10%
16.05		Molluscs and Crustaceans and preserved or prepared molluscs:		
	01.00	Crustaceans:		
	01	Spider-crab and crab	40%	10%
	99	Other	40%	10%
	02.00	Molluscs:		
	01	Clams, locos, machas and picos	40%	10%
	99	Other	40%	10%
15.04		Fish and marine animal fats and oils, including refined oils:		
	01.00	Cod liver:		
	01	Crude	0	
	02	Semi-refined and refined	0	
	02.00	Other fish liver oils:		
	01	Crude	0	
	02	Semi-refined and refined	0	
	03.00	Of fish, crude	5%	
	04.00	Of fish, refined and semi-refined	10%	

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ISBN 92-5-101143-5